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ISSUE 20 ● DECEMBER 1992 ● £1.50

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INSIDE

• **BE A POWER PRODUCER**

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AMOS: Page 106

• **TOTALLY TOP DRAWER?**

Could Pro Draw 3 be the package that'll transform your DTP creations?

DTP: Page 73

• **BANISH THOSE BLUES!**

Twenty-one pages of expert solutions on every Amiga problem under the sun

Amiga Answers: Page 17

• **BEAT YOUR BUDGET**

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EXCLUSIVE! THE NEW AMIGA A1200 REVEALED

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AMIGA SHOPPER
AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 17; the many PD programs covered on page 163 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

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Are there any products or subjects you'd like us to take a look at? Well, just drop a line to:

Amiga Shopper,
30, Monmouth Street,
Bath BA1 2BW.

WELCOME

Jeez, what an issue! First up, it's the biggest ever - a mere 180 pages of everything that's happening in the Amiga world - and second, we scooped the story on the new A1200. But the news did come rather late in the day so you'll have to excuse the fact there's no mention of it in *Talking Shop* where I'm ranting on about the new A4000 and how it may as well be a Ferrari for its lack of affordability.

So the specs and, more importantly, the price of the A1200 are a blessing. A 68020-based Amiga should give you around 4 times the performance of a standard A500/600. It comes with the new graphics chipset, 2Mbs of RAM, the memory card slot and a keyboard with keypad - all for around £500. Like the A600, there's a hard disk version planned too. It can only be good news for anyone seriously interested in DTP, graphics, video, and number-crunching. So the only thing I have left to say is 'At last'!

But those A500, A1500 and A2000 owners among you wishing to power up beyond the performance of the A1200, and the A3000 if it comes to that, should check out our accelerators round-up on pages 67-71. And if anyone wants to get to grips with the practicalities of ray tracing in the feature on pages 53-61 then I should turn to page 67 again because any graphics intensive work requires some pretty mean processing power if you haven't got all the time in the world.



So as we enter the last lap of the year it looks as though things are really on the up and up. 1992 has seen three new Amigas, a CD-ROM drive, and some damned good software. And, of course, the continuing success of a great magazine - which, incidentally, comes with a cover disk next month!

Enjoy the ish!

Andy Stoner
Editor

PUBLIC DOMAIN WORLD

FABULOUS NEW FISH

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month we focus on new astronomy and genealogy programs, an appointments scheduler, a couple of neat disk management utilities and the very latest Fred fish disks. Public Domain World or

Catch it while you can

as we call it this month, start on page 163

AMIGA ANSWERS

21 PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. And for beginners our easy Expert Tips will help you get to grips with your Amiga, and understand the other features in this month's issue.

We answer questions every month on Workbench • The CLI • Comms • Programming • DTP • Video • Business software and more.

THE ANSWERS START ON PAGE 17

FOR A FULL LIST OF CONTENTS, TURN THE PAGE

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This magazine comes from Future Publishing, a company founded just seven years ago, but which now sells more computer magazines than any other publisher in Britain. We offer:

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AMIGA SHOPPER
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So how about winning another year's free subscription? This time it's all about trendy Los Angeles where the new A4000 was launched. Okay, who was the psycho who died in Beverley Hills on September 12th? You got it? Then just send his name on a card to: 'L.A.'s a riot', Amiga Shopper, 30, Monmouth St, Bath, BA1 2BW. First out the bag wins 12 free issues . Oh, and last ish's winner was DGW 'they put his head on a spike' Griffiths of Cheltenham and the Eastenders winner was Col 'Dagmar' Coupland of Scarborough. Smart!

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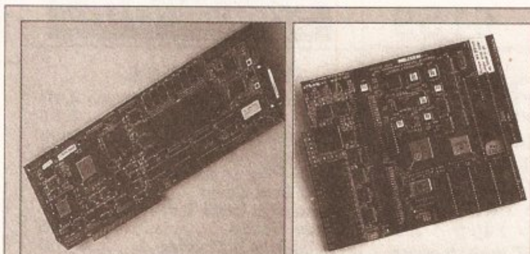


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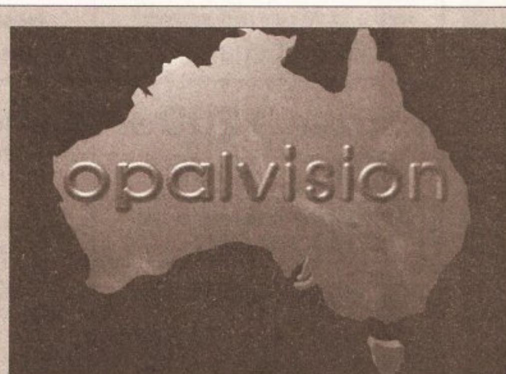
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KXP1124i 24pin	215
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Epson LX400 9pin	135
Epson LQ570 24pin	265

Prices include VAT cable & paper

Naksha Scanner
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Naksha Mouse
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New Price
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Dr. T's Midi Music Software (not for A500+ or A600) £4.95

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for A1500

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GVP ram £25 per 1Mb

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CBM A2088 XT for A1500	£99

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Colour hand scanner

Power Computing has launched its colour hand scanner for only £239.99.

The price includes version 3 of the *PowerScan Professional* software, which is compatible with Power's mono scanner and is available as an upgrade to existing owners for £15.

The scanner offers four scanning modes: text, greyscale, colour halftone and colour. Images are scanned in up to 4096 colours. Note that although the images can be displayed in HAM mode, with the colour fringing inherent in that mode, they are actually stored in a full 12-bit format without any loss of colour resolution.

The scanner plugs into the expansion slot of an A1500/2000/3000/4000. An alternative version will plug into the side slot of the A500 or A500 Plus. The latter version comes with a through-port which, Power claims, is compatible with all A500 expansions.

Facilities provided by the supplied software include the ability to scale, rotate and skew images, crop images, and clean up, lighten or darken images. Drawing functions are also provided. Power Computing ☎ 0234 843388.

COVER DISK FOR AMIGA SHOPPER



Next month *Amiga Shopper* will be appearing with a cover disk. They said it couldn't be done, but we're going to bring YOU a disk packed with the latest and greatest in shareware and public domain utilities.

The *Amiga Shopper Shareware Collection Volume I* will be chock full of the very latest in useful programs for your Amiga – you won't have seen their like before. And of course they'll be accompanied by the very best in step-by-step instructions that you've come to expect from THE serious Amiga magazine.

The January issue of *Amiga Shopper* will be available on December 3 for the special price of £2.25... with a cover disk.

Buy it; you know it makes serious sense.

NEW HIGH-POWERED AMIGA FOR UNDER £400

Commodore has unveiled its latest Amiga, the A1200, to an audience of 100,000 at the Future Entertainment Show in Earls Court. After months of speculation, the machine that everyone has been waiting for has finally arrived.

Incorporating the same latest graphics technology as the A4000, launched only two months ago, the sub £400 machine promises to provide strong competition for Atari's Falcon in the mid-range productivity marketplace, as well as being the ultimate games machine.

At the heart of the A1200 is Motorola's 32-bit 68020 processor. It comes with 2Mb of RAM as standard and a single floppy drive

Turn to pages 10 and 11 for the full exclusive story.

FUTURE ENTERTAINMENT EXTRAVAGANZA

If you've bought this issue of *Amiga Shopper* as soon as it hit the streets, then you'll still be in time to get yourself down to Earls Court for the Future Entertainment Show, incorporating the World Of Commodore.

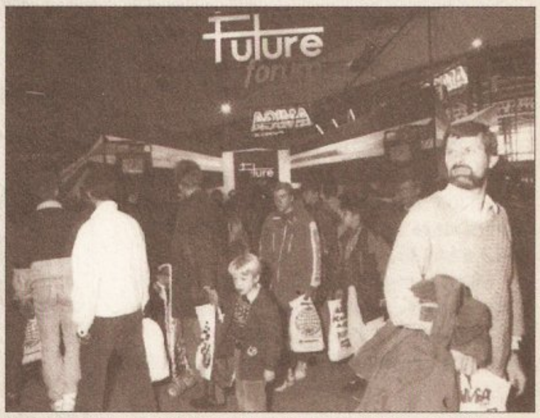
Running from November 5 to 8, the show promises to be the biggest of its kind for years. It will be devoted to every aspect of electronic entertainment, including Amiga productivity software, games, Nintendo and Sega consoles. Further attractions include a huge video wall and the finals of the National Computer Games Championships, to be shown on ITV's forthcoming Bad Influence TV programme.

The Radio One RoadShow will be present throughout the show, and Adrian Juste will be broadcasting live from the show on Saturday.

You'll also find a big supplement about the show in the November 2 issue of the Daily Mirror, just to help you get the most out of it all.

Drop in and say hello. The *Amiga Shopper* crew will be there and happy for a chat, and we'll be holding our famous *Amiga Answers* technical workshops throughout. You'll also get the chance to witness the launch of Commodore's marvellous Amiga 1200.

The doors to Earls Court open at 9.30am, so get yourself down there early to avoid the rush, because there's certainly going to be one.



See the future of electronic entertainment, and the Amiga in particular, at the Future Entertainment Show

FINAL COPY BECOMES PENULTIMATE COPY

Gordon Harwood Computers is to distribute version 2 of SoftWood's *Final Copy*.

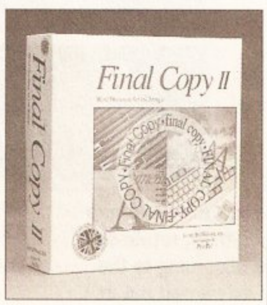
SoftWood is the manufacturer of *Pen Pal*, also distributed by Gordon Harwood Computers, now at the new price of £49.95

Final Copy II will print smcooth outline fonts to any Workbench supported graphic printer from any Amiga. Furthermore, it includes features such as graphics cropping, drawing, text over graphics, PostScript output, text leading and spacing, zoom facilities and automatic hyphenation.

Although *Final Copy I* was available in this country as a grey import, an official UK version was never released. *Final Copy II* is the first version to be officially available with full Collins British-English Spelling and Thesaurus dictionaries. Harwoods will be providing a technical helpline for registered users, along with an opportunity for owners of the grey-imported version to upgrade to the official version 2.

Final Copy II requires 1Mb of RAM and either two floppies or a hard drive to run.

It costs £99.95 from Gordon Harwoods ☎ 0773 836781. The manufacturer SoftWood is on ☎ 0101 602 431 9151.



***Final Copy II* provides DTP-like facilities in a cheap and easy to use package**

HARD DRIVES FOR CDTV

SCSI hard drives are now available to CDTV owners thanks to trade distributor ZCL.

Existing owners can buy the drive as an external boxed unit along with a plug-in SCSI controller. Initially the units will sell with 65Mb capacity hard drives.

The external version costs £349.99

ZCL will also be selling CDTVs with 65Mb hard drives already installed internally. The whole lot will cost £649.99, or £699.99 for the Multimedia pack with keyboard, disk drive and so on.

The drives will be available from most retail outlets, and are distributed in the UK by ZCL ☎ 0543 414817.

Low cost 16-bit sampling

Microdeal is to launch a 16-bit stereo sampler for the incredible price of £149.95.

Clarity 16 contains two analog to digital/digital to analog converters to provide stereo sampling and playback at up to 44.1KHz. As well as having the facility to output sound to an amplifier or mixer, the package includes a facility to replay samples through the Amiga's standard audio hardware, but using advanced mathematical techniques to give a resolution of 14-bits. A MIDI interface is also included on the cartridge.

The software provided includes all of the standard sample editing functions. In addition, sophisticated operations such as digital filtering, Fourier analysis and re-synthesising of samples to alternate frequencies are also possible. Possible real-time effects include echo, flange, reverb, chorus and distortion. The input samples can be monitored with the softwares VU meters, oscilloscopes or Fast Fourier Transform displays. A simple one track sample sequencer is also provided, as is the facility to use the Amiga as a multivoice MIDI keyboard emulator. Clarity 16 will cost £149.95 from Microdeal ☎ 0726 68020.

Rush of RAM

Two companies have released RAM cards for the A600's credit card slot, both claiming to be the first to do so.

The Calibra, from Taurus Distribution, is available in two sizes: 2Mb and 4Mb. Both will fit in the PCMCIA slot of the A600 or A1200 to increase the machine's Fast RAM capacity. Taurus Distribution is planning further PCMCIA cards, including a modem/fax card, an Ethernet adaptor and a SCSI-II interface. The cards will be availbale from most retailers. Taurus Distribution ☎ 0543 414939.

Silica Systems is to market the Amitek PCMCIA cards. Again, these are available in either 2Mb (for £129.95) or 4Mb (for £179.95) prices. Silica Systems ☎ 081 309 1111.



First sighting of a PCMCIA RAM expansion for the A600

POWER BULLETIN BOARD

Promonent Amiga dealer and developer Power Computing is to launch its own bulletin board service.

The Power House Bulletin Board System will provide a free service to callers, with product information, technical descriptions and 'wanted' and 'for sale' sections. Power will also be providing free technical advice to callers.

An optional registration fee will make users eligible for discounts of between 5 and 15% on Power products. A large range of software will also be available for download.

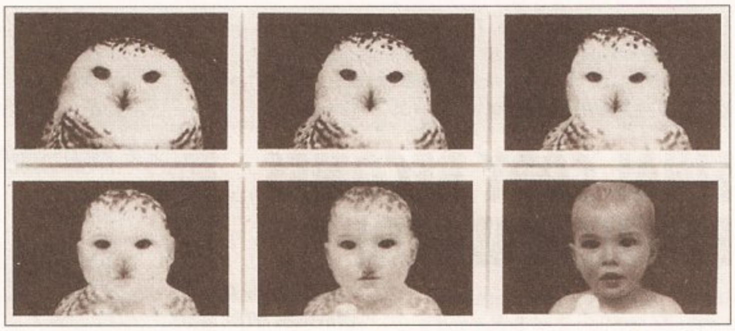
The Power House Bulletin Board System is on ☎ 0234 841503. Power Computing's voice line is ☎ 0234 843388.

MORPH FOR YOUR MONEY

MicroPace is to sell ASDG's brand new graphics morphing package, *Morph Plus*.

The package can operate as a stand-alone program, or be integrated into ASDG's *Art Department Professional* image processing package. As well as creating still or full motion morphs and warps, it will map images on to spheres (which may be rotating), rotate and twist images, and ripple distort images according to the rules of wave interference. Effects can be carried out in two modes: fast or high quality. The package is ARexx compatible, and requires Workbench 2 or higher to run.

Morph Plus is available for £199.95 from MicroPace ☎ 0753 551888. ASDG ☎ 0101 608 273 6585.



Incredible *Terminator 2*-style effects are possible with ASDG's *Morph Plus* package

LOW COST VIDEO FROM MICRODEAL

Microdeal will soon be launching Videomaster, a low cost hardware and software video system for the Amiga.

Videomaster contains a digitiser which can record monochrome quarter screen pictures at up to 25 frames per second directly from a video recorder or camera. Colour stills can also be digitised, using supplied colour filters.

The package also includes a sound sampler, complemented by a sound recording and editing program.

The whole lot comes together in Videomaster's sequencing software, with which video clips and sounds can be joined to create short 'movies'.

Videomaster costs £69.95 from Microdeal ☎ 0726 68020.

TROUBLE WITH CLR

The Central Licenceware Register has removed PD Soft from its list of members. Anyone who has bought CLR Licenceware from PD Soft of Essex for more than the fixed rate – £3.50 for one disk programs, £4.50 for two disk programs and £4.99 for three programs – is advised to contact the library for a refund of the difference. No more than 50p should be charged for postage.

UK DISTRIBUTOR FOR OPALVISION

ZCL is to become the exclusive UK distributor for OpalVision, the 24-bit graphics system reviewed on page 99 of this month's issue.

ZCL will be selling the board, along with *OpalPaint*, *Opal Presents*, *Opal Hotkey* and *King Of Karate* for £762.58. ZCL ☎ 0543 414817.

WORDWORTH UPDATE

Version 2 of Digita International's *Wordworth* is ready for launch.

The word processor offers many improvements over its predecessor, including the facility to print at the highest resolution of whichever printer is connected. Printing operations overall have also been simplified, and the user inteface as a whole has been improved as a result of research at the University of Wales.

Wordworth 2 can scale fonts to over 800 points in size, and comes with 17 Agfa scalable fonts. The package costs £129.99. Upgrades for existing owners will cost £49.99, while a trade-in deal is available to owners of other word processors for £59.99. Digita ☎ 0395 270273. Turn to the back page for a chance to win one of 15 copies of *Wordworth* in this month's competition.

GAMESMASTER MAGAZINE LAUNCHED

Future Publishing (the makers of the lovely *Amiga Shopper*) is to launch a magazine to tie in with the popular GamesMaster TV programme.

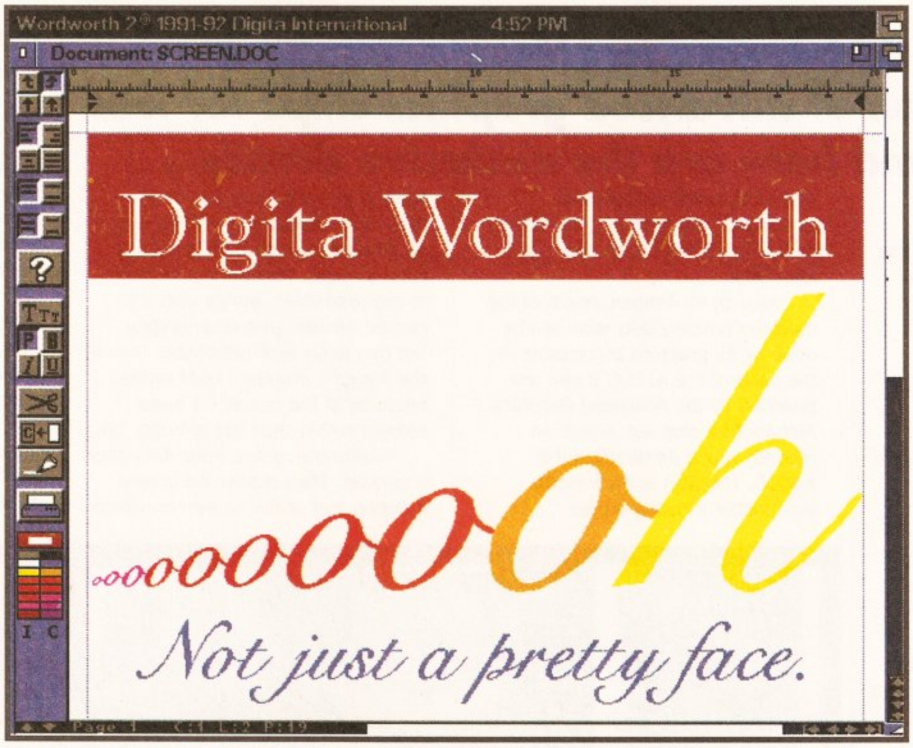
The magazine, called simply GamesMaster, will deal with games for the Amiga, PC, Sega and Nintendo machines, and will include a Consoletation Zone hosted by Patrick Moore.

The first issue will be on sale December 3 for £1.75, and will include a free tips book mounted on the cover.

DIARY DATES

November 5-8: The Future Entertainment Show. Earls Court 1 & 2, London. Tel: 051 356 5085

Actual screen. Not simulated.



If you want to take a closer look at the new Wordworth call 0395 270273, or write to Digita, FREEPOST, Exmouth EX8 2YZ ENGLAND

Actually, you're looking at the new Digita® Wordworth® version 2.

It's the revolutionary Intellifont® technology which produces on-screen fonts at sizes from 3 to 800 points!

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Which means, in human terms, unbeatable print quality. Just click the icon on the tool bar and in seconds you'll be printing jagged-free letters and graphics.

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New features include • columns • tool bar • indexing • table of contents • endnotes • improved mailmerge and file support • bookmarks • text sorting • improved search and replace • hotlinks. In fact, there's over 100 new features and improvements.

So, if you want to print the sharpest possible letters around, trade up now from any Amiga word processor for just £59. But hurry, this is for a limited period only.

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A1200: AMIGA POWER

It's here – the first Amiga to offer Commodore's new generation of advanced graphics chips for less than £400 – and here are the exclusive details...

The mid-range machine long expected to fill the power gap between the A600 and A3000 has finally arrived in the form of the Amiga A1200.

Receiving its first public unveiling at London's Future Entertainment Show on November 5th, the new machine wowed showgoers with its impressive graphics capabilities and speed.

The A1200 will initially go on sale at the incredibly low price of £399.99, causing a certain amount of conflict with the A600 Christmas bundle, currently priced at £349.

As with the A600, a version of the A1200 with a built in hard disk is also expected for around an extra £100.

BANGS PER BUCK

What you get for this money is certainly impressive. The machine's casing is similar to that of the A600, but deeper and with a numeric keypad.

The central processor is Motorola's 68020 running at 14.28MHz and a PCMCIA slot is included making the machine compatible with peripherals for the A600 and even peripherals for computers from other manufacturers. There is also a slot for users to easily upgrade to faster processors at a later date. Disappointingly, a single 880K floppy drive is also provided as standard, but it is expected Commdore will introduce the high capacity 1.7 Mb floppy drives at a later date.

As with all Amigas, much of the machine's heavy duty work will be done by its graphics processors. In the case of the A1200 these are provided by the Advanced Graphics Architecture chip set, which so recently made its debut in the A4000. The AGA is backwards-compatible with the earlier Enhanced Chip Set as found in the A500 Plus and A600.

NEW SCREEN MODES

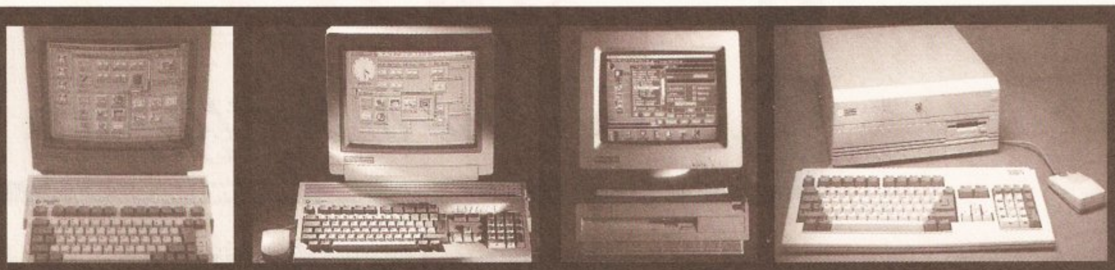
In addition to all of the ECS's facilities, the AGA also provides a number of new screen modes. Screen resolutions are now user-definable, ranging from 320x200 to 1280x400 pixels in size. The use of overscan makes higher resolutions possible. A palette of 16.7 million colours is made available by the AGA, up to 256,000 of which may be displayed on screen at once in HAM-8 mode. This mode, available in any resolution, brings with it a certain amount of colour fringing, but this is far less noticeable than in the Amiga's standard HAM mode because of the use of 64 base colours rather than the ordinary 16.

Hardware sprites have also been improved. Their resolution is now independent of the screen on which they are displayed, and their maximum width has been increased to up to 64 pixels.

Hardware scrolling has also been beefed up – screens can now be moved in any direction in a fraction of a pixel increments. Multiple playfield abilities – as used in games such as *Sonic The Hedgehog* to create parallax scrolling effects – have been enhanced to provide up to two playfields, each with a maximum of 16 colours.

On the software side, the A1200 comes with AmigaDOS Release 3 – the collective name for the latest versions of Workbench and Kickstart. The new operating system offers several advantages over Workbench 2.04, including the ability to directly access MS-DOS formatted floppy disks and hard drives, a PostScript printer driver and foreign language support. It also provides full support for the new screen modes of the AGA chip set.

Commodore hopes to have 25,000 A1200s in retail channels by Christmas. So you should be able to buy one right now.



Commodore's revamped Amiga range now consists of four machines. While the future for the A600, A1200 and A4000 is assured, doubts hang over the A3000. Could yet another new Amiga - perhaps the A2400 - be waiting to replace it? Meanwhile, the A1200 represents the leading edge of affordable Amiga power - outperforming an A500 nearly fourfold

FILLING THE VACUUM

The thinking behind the launch of the new machine is pretty straighforward. With the phasing out of the A1500 and A2000, a large gap was left in the Amiga range between the A600 and the expensive A3000.

The A1200 fits very nicely between these two machines, in terms of both price and

WHAT DOES THE INDUSTRY THINK? – AMIGA SHOPPER ASKS THE PE

INITIAL SHOCKS

"Wow! Brilliant, isn't it? I must buy one! It sounds like the machine we've all been waiting for."
– Mark Smiddy, Amiga developer

"I'm buying one the day they're released. It makes up for all the silly things Commodore did with the A4000." – Jolyon Ralph, CDTV developer

CAUTIOUS OPTIMISM?

"[along with the A600 and the A4000] these product announcements exemplify Commodore's continued commitment to offer computers with probably the best price/performance ratios in the computer industry today."
– James Dione, president and general manager of Commodore US

"I think that's excellent. It's great news for us. I think the Amiga has a good product range, and a good software base. It's a one horse race unless Atari can pull it around."
– Jeremy Rhlll, MD, Digita

"From what you say, it's going to be a good seller. It should be good for video." – Graham Kelly, Trilogic

MORE COMMITMENT

"We are confident that these products, particularly the A4000, will keep Commodore at the forefront of multimedia technology and enable us to continue our aggressive push in the multimedia marketplace."
– James Dione, CBM US

"If Commodore market and advertise it right they'll clean up. This is a great step forward for the Amiga community because it shows that Commodore are committed." – Toby Simpson, Millennium

"This machine should represent great value for money for those wishing to develop software on low-end Amigas. We're very pleased that such a high specification machine is being made available at such a low price." David Link, MD of HiSoft.

"The new A1200 is a step in the right direction and confirms Commodore's commitment to the Amiga range." – Gary Anderson, MD of Merlin Express

AND THAT NEW ATARI?

"The Falcon still uses GEM, which is awful, whereas the Amiga has Workbench with its scaleable font technology and so forth. At that price it encourages me to continue producing high quality software like *Wordworth*."
– Jeremy Rhill, MD, Digita

"From what I can gather, I'm not sure

- AT A MEAGRE PRICE!

HOW THE AMIGAS COMPARE

Shown here is the current Amiga range, giving a direct correlation between price and performance for each of the machines. The A1200 fills what was previously a yawning gap in the Amiga range. Bear in mind that we are only comparing processing speed against price – there is also the graphics factor to take into account when making a purchase, as well as the different expansion possibilities that each machine offers.

AMIGA	PRICE	MIPS	POWER PER £
A600	£299	0.75	1
A1200	£399	2.5	2.5
A3000	£1299	9	2.8
A4000	£2466	19	3

performance. Nevertheless, there's still a substantial difference in price between the A1200 and the A3000. An A2400 – or whatever name Commodore finally decides on – looks likely, probably with an 68030 processor and better expansion capabilities.

> *"What you get for your money is certainly impressive "*

With the sudden halving of the A3000's price only two months ago, and a subsequent drop of its price in the USA to only $1500, it seems a distinct possibility that the A3000 is not long for this world. Commodore's Andrew Ball hinted to *Amiga Shopper* that it might not be long before we see an A4000 with an '030 processor at a lower price, giving further weight to the theory that the A3000 has had its day.

If something like an A2400 is released at a lower price, then Commodore would have a full range of Amigas, ranging from the A600 for the home enthusiast right up to the top of the range A4000 at the cutting edge of personal computer technology.

CLONE COMPETITORS

Despite the A1200's excellent capabilities, Commodore's continuing success in the home enthusiast market is still not assured. While it looks like trusted technology and a large software base, combined with better performance, may have beaten off the forthcoming threat from Atari's Falcon before it even hits the streets, the competition from PC compatibles remains.

With their ever-decreasing prices and increasingly better specifications, the clones are mopping up many new buyers for whom a 68000-based Amiga is no match for a similarly priced 386. But the faster, more powerful and graphically stunning A1200 should at least maintain Commodore's slice of the home market.

However, recent news that Apple has now joined the fray with an aggressive pricing policy that all of a sudden makes the Macintosh look like a very attractive alternative only complicates competition further.

How Commodore will fair in the 32-bit wars only time will tell, but at least the stagnation has ended and it has set its sights on continuing its domination of the UK home computer market by offering more power for less price.

LE IN THE KNOW

there will be any competition." – Andrew Ball, CBM public relations manager

"If it's as good as it sounds the Falcon seems to have some stiff competition. The only doubts in my mind are rumours about incompatibility. But it looks like a winner." – Gary Anderson

"We know the specification: we don't know how well it performs. We understand reproduction of still images is as good as on the Falcon, but moving images are half the quality of that of the Falcon. We see as it as a stop gap measure, an afterthought" – Peter Walker, Atari public relations

THE 32-BIT WAR BEGINS HERE

Atari makes many claims for its forthcoming 68030-based Falcon machine – 16-bit colour from an 18-bit palette, built-in genlock, digital signal processor, built-in networking, multitasking and screen interlacing with overscanning. All for a projected price of £499 - £100 more than the new A1200. But beneath the hype lies the real performance characteristics and even though the Falcon has a more powerful processor, other factors will combine to give the A1200 the edge.

HEAD TO HEAD: A1200 VERSUS FALCON

	AMIGA A1200	ATARI FALCON
CPU	**14Hz 68020**	**16Mhz 68030**
MIPS	2.5	3.84
RAM	**2Mb (up to 18Mb)**	**1Mb (up to 14Mb)**
Upgradable CPU	yes	no
Floppy drive	**880k**	**1.44Mb**
Optional HD	yes	yes
Drive controller	**IDE**	**SCSI-2/IDE**
Custom graphics	Alice,Lisa, Paula	none
Digital Signal Processor	**no**	**yes, 32Mhz**
Sound	8-bit, 4 channel,	16-bit, 8 channel
Network port	**no**	**yes**
Expansion slots	PCMCIA slot	DSP expansion slot
OS	**AmigaDos 3**	**MultiTOS**
Multitasking	yes	yes
Graphics modes	**9**	**6**
	1280x400[1]	320x200[2]
	1280x200[1]	640x480[3]
	800x600[1]	320x200[3]
	640x960[1]	640x200[3]
	640x480[1]	320x400[3]
	640x400[1]	640x400[3]
	640x200[1]	
	320x400[1]	
	320x200[1]	

[1] All A1200 modes offer 256,000 colours from a palette of 16.7m

[2] 32,768 colours from262,144

[3] 256 colours from 262,144

Although the Falcon's faster processor would appear to deliver greater performance, the way graphics and memory are handled effectively undermines any such advantage. This is because the CPU and the graphics hardware share the same memory address bus which means that either the processor or the graphics must slow up when both are simultaneously in use. As such its blitter is crippled.

The Amiga, on the other hand, with the addition of Fast RAM, enables both the 68020 and custom graphics chips to access memory simultaneously with no drop in speed. Consequently, it should beat the Falcon in terms of raw graphics processing power.

In terms of multitasking too, the Falcon is a bodge. MultiTOS is based on the old CP/M 68K code in the original ST and is not capable of pre-emptive multitasking like the Amiga. This means there is overall control of the various tasks running and if, among other things, a badly written one should hog the processor, the others will come to a stand still.

Atari claims the Falcon has a built-in genlock but in fact it requires 'an adaptor to print to video'. In other words, it has genlockable display modes, just like the Amiga, but requires an *external* genlock in order to record to video.

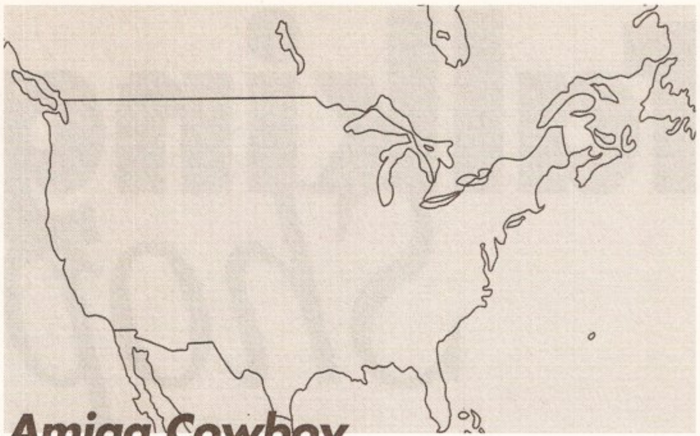
Also, the sound chip in the Falcon is a straight 8-bit DMA device which feeds data to the Digital Signal Processor in order to produce 16-bit 8 channel sound.

Admittedly the Falcon does have additional 16-bit digital to analog and analog to digital converters built in as well as integral DMA audio signal co-processors, but there is no reason these couldn't be offered on A1200 PCMCIA cards.

But it's probably in the graphics department where the crucial difference between the two machines lies. The A1200's AGA chipset features a full 24-bit palette giving access to any one of 16.7 million colours – 64 times the number of colours available to the Falcon.

Moreover, with the A1200's new AGA HAM-8 mode, which can be used with any screen regardless of resolution, you can create images that use over 256,000 colours at once.

In conclusion, the Falcon may win in the sound department, and this is likely to be the market where it will end up, but in all other areas the A1200 wins hands down. Commodore has delivered the goods.



Amiga Cowboy Bob Liddil brings you the first in a regular series of news, views and rumours from the good 'ole US of A

A great debate is raging in the USA, among Amiga enthusiasts and Commodore detractors (some of whom are one and the same). The central issue? When will Commodore end its ho-hum treatment of the Amiga in the USA and begin taking America seriously as a computer marketplace?

A few months ago, fledgling newspaper, *Amiga News*, published in Peterborough, New Hampshire, even went so far as to print front page headlines asking, "IS THE AMIGA DEAD?" which stirred up incredible dusty clouds of controversy among dealers, enthusiasts, detractors, and a few totally unconcerned IBM users who incorrectly believe their own machine is the niftiest in the known galaxy. Up until that time, the most complimentary thing anyone had to say about Commodore USA could be pretty much be summed up with a single co-ordinated movement of hand, arm and digit of the hand. I'm not making this up, folks. Dealers, users, even Commodore employees were hard pressed to defend CBM management and most wisely, politely refrained from public comment.



The launch of the A4000 in Pasadena has caused a certain amount of controversy

A4000 MEGA-LAUNCH

But in the underground, rumours had been circulating for months of a wonderful new machine, the answer to life, the universe and everything Amiga. It was... The Amiga 4000... and was spoken of with reverence in the hallways and computer rooms of American Amigadom.

Commodore, who would not acknowledge a single word about the A4000, was, in fact, preparing to announce its new arrival to attendees at the World of Commodore Amiga Show in Pasadena, California, on Sept 11. Apple, years ago, introduced one of its next generation of computers to North America via the convincing vehicle of television advertising, in a single short stroke – Superbowl! Meanwhile, Commodore premiered its newest, and what may prove to be its best technical achievement since the original Amiga, in Pasadena to a few thousand devoted enthusiasts and dealers, with all the fanfare of a hot air balloon race on a foggy afternoon. Yep, Commodore bashing is a habit too easily acquired in the USA and one harder to lose than that of dipping snuff.

So, what about this fantastic A4000? What's it all about? Well, the introduction of the AGA (formerly called AA) chip set in the A4000 has got many A3000 owners up in arms about not being able to plug the AGA chips into their machines. But, Commodore never claimed this – it's been saying for years something along the lines of 'any theoretical 32-bit chip set will not work in any of the current (pre-A4000) Amigas'. There's a great deal of physical impossibility involved in plugging a 32-bit chip into a socket only wired for a 16-bit chip, and that's what you'd have to do to use AGA.

But before any of you start mourning your A3000 as orphaned, think about this. One of the effects of the A4000's introduction will be to drive down the 3000's price (there were said to have been 3000/25-50s at World of Commodore-Amiga for under US$1,500). A result of the introduction of the 4000 will be lots more Zorro III equipped machines out there, and more incentive for developers to come out with real 32-bit Zorro III cards which can work not only in the new computer, but in your 'outdated' 3000 as well.

FOR THE LOVE OF IDE

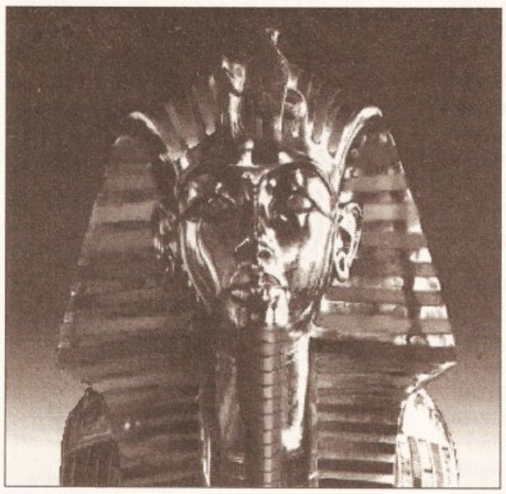
But one of the big question marks over the A4000 is why CBM use an IDE controller instead of SCSI? Well, the answer is that it was essentially free to manufacture. Apparently the IDE controller consists of just a few minor adjustments to one of the custom chips. But, the general consensus is that on a $3,000 machine that's supposed to be a multimedia workhorse, free IDE is a lousy trade-off for SCSI. Most buyers would probably be willing to pay an extra $100-200 for an A3000-style on-the-motherboard SCSI.

Commodore has promised to come out with a fast Zorro III SCSI card soon, but installation leaves only three free expansion slots. So, one bright side to the 4000's IDE controller is that we'll probably soon see lots of new Zorro III SCSI boards from third parties.

Another frequent A4000 question asked is why has it only two megs of Chip RAM? Well although more Chip RAM would have been nice to have, it's not as if the machine is crippled by the 2 meg limit. You'll just be able to open fewer 262,000-color 1280x400 screens than you'd like - that's all.

FORTHCOMING AGA SOFTWARE

Some might be worried that it will take a while for software to support the AGA chipset. But unless you're into games, don't be. Existing *2.04*-compliant applications can be updated relatively easily, and we're already starting to see some software with AGA support. By the end of the year, The USA will likely see AGA-supporting products such as *ProWrite 3.3, Final Copy II, 'Brilliance'* – an impressive new paint program from Digital Creations, *DPaint 5* (!), *ProDraw, ProPage, Page Stream,* and *Imagine.* ASDG has announced a "Retroactive Upgrade" to support AGA machines for *Art Department Professional.* The upgrade is retroactive in that *ADPro 2.1* has already had AGA support for months! Also recently announced from ASDG is support in *ADPro* for the Abekus Digital Disk Recorder, a high-end Videographer's tool.



It won't be long before we see version 5 of one of the Amiga's most popular programs

AND IN THIS CORNER...

Rumor has it that Commodore and NewTek are just about at each others' throats. Each blames the other over the fact that the Toaster doesn't fit in non-2000 machines. There has also been a lot of contention over NewTek's Toaster Workstations clogging up Amiga dealerships, and NewTek has decided to stop selling the standalone Toaster boxes. Commodore has apparently gone so far as to threaten revoking Amiga dealership status to anyone selling Toaster Workstations. Doesn't this seem infantile and just a little bit like two cats with their tails tied together?

So the A4000 has hit the USA like a thunderstorm. We love it, but every American Amiga user has a different opinion. It's what makes us Yanks! I have not seen any television adverts for this or any other Commodore product.

Until next month, this is your Amiga Cowboy sayin' Yippietiyiyay, pardner, rope yourself a PAL version of the A4000 as soon as Commodore makes it available on your side o' the pond. But don't wait for them to advertise it! AS

Talking *Shop*

Welcome to the Amiga world's liveliest letters pages! – the place where you get the chance to speak your mind. So join your host, the editor, Andy Storer for some more no-holds barred bantering. And remember, all you have to do to be included is send your missive to: 'Talking Shop', *Amiga Shopper*, 30, Monmouth St, Bath BA1 2BW. So get to it!...

THAT NEW ATARI

Being an ST and Amiga owner I try to consider myself unbiased. I therefore read with interest your comments about Atari's Falcon. Quote: "Who's going to develop for it these days when all the main software houses pulled out of the ST market well over a year ago?"

Despite the fact that the vast majority of software houses do still support the ST, there has been a very positive reaction from major companies promising support for the new machine and development machines have been with them for quite a while now. Interested parties include the Bullfrogs, US Gold, Microprose, Mirage, System Solutions, Compo, Hisoft, HGS etc.

The industry standard sequencer, CuBase, is already being rewritten to make use of the advanced audio features. Other packages being developed include realtime 3D rendering, photo retouching, video titling, graphic equalization, direct to hard drive recording system, a multi-effects processor, true colour art packages one of which is rumoured to be Deluxe Paint 5 (a package very close to an Amiga owner's heart!).

All of the advantages the Amiga had over the ST have been thought of including sound, colours, scrolling, overscan, genlocking, multitasking etc...

Many Amiga owners seem to be sitting very tentatively on their throne judging by the worried letters about PCs and the Falcon in various Amiga mags. I don't care if Commodore or Atari market the computer, I just want the best computer for my money with state-of-the-art software. Development and support for the Falcon looks pretty certain and it's set to add a new dimension to home computing.

With all this in mind I'm not going to miss out on the opportunity of buying the computer of the 90s.

Stephen Lord
Lancs



Atari's new Falcon - is this the new king of home computing or the next white elephant in the living room?

Like I said last issue, I think the Atari Falcon really is an incredible deal. But, apart from the music side of things - Atari's sales heartland, why would anyone buy one? The ST range has been marginalised in all other areas. And that's why I think you should wait and see what software arrives rather than rely on the stated intentions to develop for it.

Nevertheless, I hope it sells in droves for the simple reason that it might spur Commodore to launch a souped-up Amiga for the same price.

NOW THAT'S RICH

I'm sorry, but I must take issue with your editorial comments to letters in the November issue of *Amiga Shopper*. On two separate occasions you totally miss the points raised by the authors in which the arguments are well put and concise.

In your reply to G.H. Jones letter, 'ON THE OTHER HAND', you state 'all computers are mere boxes' – that's true enough but then you follow this with 'it's what you run on them and why which makes the difference – not the particular spec of the hardware'. Utter nonsense.

It's common sense that new hardware development must in turn lead to new software development, I mean there's only so far that any developer can push an unexpanded A500, A600 or even a low spec A3000 for that matter and it's this singular lack of development by Commodore that is the real cause of concern for anybody that uses their Amiga beyond games. If it wasn't for the enterprising third party developers then the Amiga as a serious platform would have died years ago!

In a second spate of utter nonsense you argue that you 'still can't see the Falcon selling in big numbers though - who's developing for it?'. Maybe my understanding of the fickle image-conscious 'Youf's' mentality and basic economics is a little astray here Andy - if Atari can sell enough units over the Christmas period then tell me one company that won't be developing for it!

Now I'm all for good editorial comment but feel basic facts have to be admitted here, the Amiga has real competition in the 16-bit arena from the consoles and the ever improving PC market, the 32-bit war has started with both Atari and Acorn off the starting blocks and in the shops with nothing in sight from Commodore. And in the only serious market to take the Amiga to heart, DTV, both the Apple Quadra and the NeXT are causing a stir.

The real fact here is that when Commodore acquired the Amiga it purchased a system that it didn't understand or for that matter really want to, the Amiga gave Commodore an entry into the 16-bit market ahead of Atari, and with its superior graphics and sound capabilities has managed to hold that position for the past seven years, but now with a new emerging 32-bit market it is panicking because it really doesn't have a product ready to complete.

What I would really like to see is a split in the Amiga range with a new high end system introduced to take advantage of the already considerable in-roads made by the A3000 system in DTV, this system would feature OpalVision graphics specification output from the mother board, a full 32-bit architecture, 68040 CPU, DSP chip and a new Unix-based version of Workbench. If this means that compatibility suffers then I for one think that would be a price worth paying even to the point of renaming the system away from the Amiga stable!

Michael L Rogers
London

I'm afraid I'm completely at a loss to understand both of your accusations of 'utter nonsense' here.

Firstly, the best way to choose a machine rests on what you want to use a machine for - not what it's got under the bonnet. If I want to just print a letter I don't buy a NeXT workstation do I? If I want to keep a check on my monthly outgoings balance I don't need a 66MHz 486 PC. You buy the machine to suit your needs and your pocket.

Secondly, if there's hardly any developers working on the Falcon, and therefore little software available over Xmas, then it's hardly likely to sell in big numbers! On this point, I'm prepared to wait and see - but hey! don't start jumping up and down in the meantime.

Otherwise I agree with every single point you make afterwards. Except that, again, you appear to forget that not everyone can afford Mac Quadras and NeXT machines for desktop video. Me included.

HE SHOOTS, HE SCORES

I read your Talking Shop special and accompanying letter section in the November issue with extreme interest, and I'd like to add to the debate. Commodore are in real trouble now, they've been stabbing themselves in the back for years, ignoring all complaints from concerned Amiga owners over their sales strategy, and now Atari are jumping on the bleeding, dying carcass of the CBM marketing department and probably laughing at the same time.

I think the rot set in way back when Commodore simultaneously released the A500 and 2000. Everybody loved the 500, a brilliant machine but does anybody remember the stunned silence concerning the original 2000? Price wise it was pitched in against the Macintosh range, once you added fairly essential additional memory and a hard drive. Did it have the eagerly-expected 68020 under its bonnet? Did it hell. Here was a computer in the four-figure price bracket which amounted to a 7 Mhz 68000 based 'box' that you had to expand to make any use of it.

That was own goal number one. Then to own goal number two, the 3000. What a joke! Here was a machine whose only differences from the 2000 were 32-bit stamped on it and a telephone number price tag. Did it have better graphics? (1280 x 400 mode isn't better graphics, just a fine tuning of existing ones.) Did it hell. Better sound? Don't be stupid.

Own goal number three was releasing a Plus version of the 500 mere months before dropping the computer in favour of the 600.

Own goal number four is the A4000, let's be kind, they got the graphics right at last and they gave it a decent processor which it's going to need to survive in the nineties, but the sound! How could they be so stupid! They're making the same mistake Atari made with the original ST.

Own goal number five is the mythical mid-range A800/2200. I'm willing to bet, considering its sudden disappearance following the release of the Falcon, that it is, or rather was, 68020 based, has/had the same graphics chips as the 4000 and a lot of other stuff, most significantly the sound, booted over from the 16-bit Amigas. The final nail in the coffin had to be a near £1000 price tag and no monitor supplied.

Now to Atari's Falcon. Are you seriously telling me someone is going to spend 12 months producing graphics for a game and not boot it straight across from PC to Falcon to 32-bit Amiga? Of course they are. The Falcon and Amiga will both have Motorola chips, any games company with an eye for profit and an easy buck will boot product around left, right and centre between the three machines. Don't anybody make the mistake of thinking Commodore will win the 32-bit war just because they won the 16 bit war. The head of CBM US is just plain wrong if he thinks users are content with a 7 Mhz 68000. People in this country have an insatiable appetite for affordable, newer, faster machines with better sound and graphics.

The reason the Amiga won the 16-bit war was that it had better sound, graphics and hardware spec than the ST, and people were prepared to cross a £200 price barrier to get at those specifications. If the Falcon has a faster CPU than the A2200, and better sound, then CBM will lose the war.

A much higher price tag will only be fuel to the funeral pyre. The only plus will be if the new Amigas custom chips can throw graphics around faster and easier than the Falcon.

Unless CBM match CPU for CPU with Atari they will lose the 32-bit change-over altogether.

I leave you with this final thought, if Kelly Sumner is so convinced the Falcon will fail, where is the A2200?

Rob Jackson
Suffolk

Hard-hitting stuff there Rob, and, despite the rather acute tone, pretty accurate. What you appear to be calling for is a new Amiga that's just as radical now, in 1992, as the original was in 1985. I went over to Pasadena for the lauch of the A4000 and yes it was pretty damn spanking good. But at its UK price, a mere £2466 or so, it may as well be a Ferrari in a car park full of Escorts. Caption: Look and dream.

Meanwhile, we need at least a 68030 machine at well under £1000. DSP processor, 16-bit sound, etc etc. Failing Atari's pulled such a machine out of the bag, why not high-flying Commodore?

BANISH THE BLOBS

Firstly I'd like to congratulate you on your excellent magazine, I have every single issue and thoroughly enjoy each one.

But now my main point. Since issue 6 you have changed from using a percentage to rate software and hardware to "blobs". In percentage terms programs can only get either 0,20,40,60,80, or 100%. For high-priced equipment, this simply is not specific enough. For example, the Video Toaster got four blobs, and for an add-on card that costs £3,030 that rating is not good enough. Seeing as reviews make up for a major part of the magazine, I and many other readers would like to see the percentage brought back.

Chris Maynard
Kent

Blobs are just as precise as percentage scores – though both are arbitrary in any case and only exist so as to give a summarised relative rating to a review product.
But at least our rating system gives you five sets of blobs – an easier way of instantly concluding a product's worthiness than getting confused over percentile averages.

So I'm sorry but we're sticking with blobs for the foreseeable future.

BRIGHT IDEAS? 1

A lot of people have said they wished the Amiga operating was completely in ROM. However if this happened you would not be able to customise the Amiga. So the one solution is to keep the Kickstart ROM as it is but instead of Workbench on disk why not put Workbench on Flash ROM (you know the chip that you can read, write and delete but all information is kept even when the machine is turned off)...

If the above was done it would be better and the Amiga would boot up Workbench quicker etc..., what do you think?

Robert Hart
London

Sounds fine to me - more speed, easier to upgrade. Any takers?

BRIGHT IDEAS? 2

DYNAMIC TRUE COLOUR - COPYRIGHT (C) NICHOLAS BLACHFORD 17/8/92

This is a method of generating a new screen mode and can be used by anyone free of charge – a gift to the Amiga community, although I have ownership of the copyright.

The Amiga has no way of displaying raw 24-bit data on the screen, this however may be changed by the following method;-

1 Set screen mode with 1 bit plane
2 Set bit plane as all 1's
3 Set up raw 24-bit data
4 Display picture but change the palette value (1) on every pixel using raw data.

This should work with most screen modes depending on memory and the speed at which the palette data can be moved.

For superhires mode (1280 by 256) or (1280 by 512 interlaced) at 50 frames per second, the palette value of 1 will have to be changed at a rate of at least 16.38MHz, or higher if overscan is used - this figure does not take into account flyback times etc...

The above mode will only be possible if the custom chips have been sped up considerably or if a faster processor has been fitted. Animation may be possible with double buffering but will require very fast RAM (25ns or faster) and another chip to shift the data.

It should work on current Amigas at a very low resolution but a faster processor (68020, 68030 or 68040) and more RAM will be required for any higher resolutions.

I don't know if the above idea will work but feel free to use it if it does.

Nicholas Blachford
Ulster.

Quite aside from the difficulty of changing the palette at 16MHz, when the 68000's only clocked at 8MHz, there's the added difficulty of being able to display only a palette of 4096 colours. Nothing like the 16.7 million colours 24-bit employs.

NO MORE PCs PLEASE

Everytime I turn to the letters page in an Amiga magazine there seems to be a letter on the subject 'THE PC IS SO DAMMED GOOD GO AND BUY ONE !!!' Please don't fill up the letters pages like this. If you're that adamant that the PC is better value then sell your Amiga's - there are others who will appreciate what a wonderful thing they are.
Perhaps I can sell my car and buy a Cosworth? I doubt that I'd be able to afford the running costs "Insurance and Parts etc..."

I could probably put four new tyres on my car for the price of an exhaust system on the Cosworth, I think there is a similar parallel on the PC. The software is astronomical - maybe five times as expensive. In some cases you could buy an A600 for the price of a word-processor.

I'd be interested to know whether the Editor is of the same opinion and can perhaps let the readers letters be for the readers and not for a continual war of words on which is best.

S.Ward
Surrey

Which, in a round about way, was exactly what I was saying earlier in my reply to Michael Rogers.

Yep, I agree, the Amiga's the reason we're all reading this – so let's concentrate on it! And forget the Falcon as well while we're at it!

'I CAN LARF ABOUT IT NOW'

Have you learned a valuable lesson from the trials and tortures of experience or overcome some mind-boggling problem through incredible ingenuity or even sheer luck? Then let us know and win yourself a fiver into the bargain. Just send your post-embarrassed tomes to 'I can larf about it now', Amiga Shopper, 30, Monmouth St, Bath BA1 2BW.

Check that waggler...

Just days before my warranty on my A500 ran out I encountered a strange problem when my son wanted to play an educational game. What happened was the program loaded in up to where it drew a loading screen and played a bit music then the whole thing locked up. I thought a corrupt disc was to blame so I tried loading a few more programs in and I found that about 60% of them failed to load. As I was packing my system up to send it to my local computer engineer, I noticed the joystick fire button was stuck in the fire position. So I thought I would give the computer another try. After freeing the fire button I had a go at loading a disc and hey presto everything was okay again.

So if you have any problems with your computer check your add-ons before you start blaming the computer - or don't let the kids play games!

Steve Morrison
Tyne and Wear

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OUR EXPERTS TACKLE YOUR REAL-LIFE PROBLEMS

AMIGA ANSWERS



ALL YOUR HASSLES BASHED TO BITS

SO WHAT DO ALL THOSE ICONS MEAN?

Beginners: this icon will appear next to any questions which are 'basic' in content.

General: this icon is used for any general Amiga-related queries.

Caution: be sure that you fully understand the answer before trying it out.

Danger: the answer to this question could well invalidate your warranty – or you!

Hardware: this icon is used to denote questions relating to general hardware.

Buying advice: we use this icon if the question asks us for buying advice.

Printers: this icon denotes a query about printers, printer drivers and so on.

Technical: any queries about programming will have this icon next to them.

Video: this icon relates to any query about using your Amiga with video hardware.

Music: this icon is for questions about MIDI, sampling, synthesizers and so on.

Programs: any program-specific queries have this icon next to them.

Comms: if your question relates to comms, this is the icon that we'll use.

WHATEVER YOUR PROBLEM WITH THE AMIGA, WE ARE HERE TO SOLVE IT

That's the task we have set ourselves in giving you the best possible support for your Amiga. We are confident that our experts can cope with any technical questions you can throw at them. If they don't already know the answer to your problem, they will find it out for you.

We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or Workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga, we will help out. What we cannot do is offer this service over the telephone – do not phone us with your enquiries, but write to us at the address below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print. You won't get a personal reply even if you enclose an SAE with your letter, so please don't bother.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of our consultant editors Mark Smiddy and Jeff Walker – and, of course, our resident deputy editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping whatever the subject of your query.

Each panelist will be dealing with queries in their own specialis area(s) so it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem.

Below is a list of areas of expertise. It's a list that we will add and update every month, so you will know who to write to about ar subjects not mentioned here.

Gary Whiteley –	Video
Paul Overaa –	Programming, music
Mick Draycott –	Hardware, programming, MIDI
Jeff Walker –	Desktop publishing, programming
Mark Smiddy –	AmigaDOS, business, CDTV, hardware projects, hard and floppy disk drives
Jason Holborn –	Public Domain, AMOS
Jolyon Ralph –	Programming, hardware, CDTV
Cliff Ramshaw –	All the other bits and pieces

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ______________________

Address: ______________________

____

____

Your machine:

A500 ☐ A500 Plus ☐ A600 ☐ A1000 ☐

A1500 ☐ A2000 ☐ A3000 ☐

Approximate age of machine: __________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ☐ 1.3 ☐ 2.x ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ 1.3 ☐ 1.3.2 ☐ 2.x ☐

PCB revision (if known). Do not take you machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) ________

Chip memory available (see AVAIL in Shell) ______________

Agnus chip (if known) ______________

Extra drive #1 (3.5"/5.25") as DF__: Manufacturer ______________

Extra drive #2 (3.5"/5.25") as DF__: Manufacturer ______________

Hard disk: ____Mb as DH__: Manufacturer ______________

Extra RAM fitted – type, size in Mb and manufacturer ______________

Details of any other hardware which could help us to answer your question:

____

____

____

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

AS 20

NO PROBLEM!

Welcome once more to *Amiga Answers*, the section of the magazine where we endeavour to straighten out your hassles with that wonderful but occasionally stubborn machine, the Amiga. Every month we devote more space and apply more resources than any other Amiga magazine to solving your problems. We receive something like 100 queries a week, so the service is obviously appreciated.

It's my job to co-ordinate the whole thing: sorting through the questions and sending them off to the relevant chappies for the kind of in-depth answers you've come to expect; and compiling them into the lovingly crafted pages which you see before you.

I call on a variety of expertise to make sure you get the answers you need, which is why *Amiga Answers* is so successful. There's Mark Smiddy, industry guru, AmigaDOS-tamer and business applications wizard; Jeff Walker, probably the most knowledgeable Amiga desktop publisher there is; and Jason Holborn, long-time AMOS explorer and PD sampler, as well as good all-rounder (or should that be all round good guy?); and Toby Simpson, lead programmer for Millennium and accelerator expert.

If it's a question about video, I'll pass it on to Gary Whiteley, our professional videographer for whom the word 'genlock' means 'mixing Amiga graphics with video for magical results' and for whom the word 'snipwirral' means nothing.

Programming queries are dealt with by Paul Overaa, who's not afraid to code in any language, and who doubles as a MIDI maestro to solve your sequencing slip-ups.

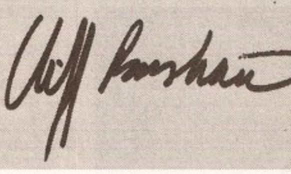
Our hardware guru is Jolyon Ralph. This man knows just about everything about disks, both hard and floppy, and what he doesn't know about memory he's probably forgotten. Communication breakdowns are fixed-up by Phil Harris.

All in all, a formidable team, supplemented by my own not inconsiderable Amiga suss. Let's face it, if we can't answer your question, it's probably one of the Mysteries of the Universe.

This month we divulge the mysteries of Chip and Slow RAM, solvre the problems of sticking notes with MIDI, give advice on writin operating system-legal interrupt routines, explain how to hook up a tape streamer to the Amiga, and much more.

Don't forget to keep sending us those problems – we love them!

Cheers,



DIP IN THE DJ



I have recently bought a Hewlett-Packard DeskJet 500C colour inkjet printer, and I am very pleased by its exceptional print quality. Something that I am having a little trouble with is the correct dip switch settings. The printer manual recommends that all the switches should be set to off, whereas the *Commodore-Amiga Workbench Guide* shows them as all being set to the on position.

Personally I feel all the switches should be set to off, except switch A6, allowing standard A4 sheets of paper to be used. Is this correct? If not, what settings should I be using to enable the printing of text and graphics from a variety of programs, including *Wordworth 1.1* and *PageStream 2.2?*

Also have you any recommendations regarding the best type of paper to use. Information in the manual is heavily biased towards the manufacturer's own paper. A friend suggested laser paper. Is this suitable?

Finally, where can I obtain a good driver for this printer, enabling colour selection? Hewlett-Packard supplies every conceivable driver for the PC, but bugger all for the Amiga.

Rob Fowler
Southend-on-Sea
Essex

The printer manual tells what each dip switch, or combination of switches, does, so set them accordingly. For instance, you've worked out for yourself that switch A6 dictates the default page size.

You'll definitely get better results printing on to Hewlett-Packard's inkjet paper. I don't know what your friend means by 'laser' paper. Most laser printers use bog-standard 'bond' paper, the same as photocopiers, and this certainly isn't the best stuff for inkjets. For best results the paper needs to have a coating of chalk, or something similar, which is why proper inkjet paper costs more.

There's no proper printer driver currently available for the 500C, the best there is can be obtained from *Just Amiga Monthly* on ☎ 0895 274449. ***JW***

PC DISCS



I've got a load of old IBM 5.25" disks lying around that I'd love to access (read text files etc) using something like *MessyDOS.* I've managed to get my hands on an old BBC 5.25" drive manufactured by Cumana. It has a pin ribbon cable with two pin correctors (one at the end and another halfway up!) and another 4 pin lead which I believe to be the power lead. Is there any way to connect it to my Amiga? Where can I get a driver for a Brother M-1409 printer? No Epson drives seem to work? Thanks for your help.

Philip Marley
Poynton
Cheshire

It's extremely difficult to link 5.25" drives to the Amiga. I have seen some circuits that say they will link 5.25" drives to it, but I know of no-one who has got one to work. Roctec and Cumana both do 5.25" floppy drives for the Amiga; I have the Roctec drive and it's very good. The Brother printer should be Epson compatible. If it doesn't work try the Star9pin driver on *JamDisk 5* (in the *JamDisk Pack* from *Just Amiga Monthly* on ☎ 0895 274449). ***JR***

SWITCH DECISIONS



Like many Amiga owners, I possess an Amiga 500 with *Kickstart 1.3.* I am very tempted to buy a ROM switcher with *Kickstart 2.04* installed.

Before doing so however, I would like your advice about which ROM switcher you consider offers the best value for money in terms of make and type (those by Pheonix, Power Computing, Cortex and so on). Is it better to get a manual or keyboard switchable one?

Alan Chambers
Ashford
Middlesex

ROM Switchers are a little like 512K RAM expansions – because of their simplicity, they're all basically the same. I use two ROM switchers – one from Cortex and one from Omega Projects and both are keyboard switchable. The Omega Projects ROM sharer is better as it comes with a built-in 'buzzer' unit that tells you when the ROM switcher is between ROMs (the reset key combination has to be held down for a while for the switcher to come into action). The Omega Projects ROM switcher costs £25 from Omega on ☎ 0942 682203. ***JH***

CURIOSITY



My main interest in the Amiga is video titling and graphics, though like many others I also dabble in DTP and other fields. However, on to the

continued on page 21

JARGON BUSTING • JARGON BUSTING

Dip switch – a method employed by several devices, including hard drives and printers, to enable the user to make manual adjustments to the way the device behaves. Printers typically have dip switches to control line feeds, perforation skips and the kind of fonts they will use.

Printer driver – a program that sits inbetween any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for a specific printer.

ROM – Read Only Memory is used to store essential programs, such as Kickstart and many of the library routines. These do not have to be re-loaded each time the Amiga is switched on because ROM retains its contents without power. No new information can be written to ROM, hence the name Read Only.

Kickstart – the most basic and central part of the Amiga's operating system, held in ROM so that it is present as soon as the machine is switched on.

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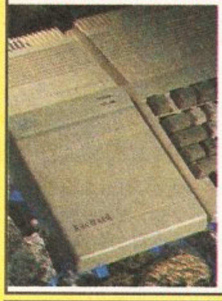


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continued from page 19

main points of my letter...
a) I have a Rombo Complete Colour solution and I wondered what the SCART-type connector with a cover over it marked "WARNING Feature connector use special lead" on the Vidi-RGB unit is for, and how to make use of it?
b) I also have a RocGen Plus genlock which has a phono connector on the back marked "KEY IN". What is this for, and how do I use it?

David E Smith
Pudsey
W. Yorks.

The Feature connector on the Vidi-RGB is to enable RGB and S-VHS signals to be taken to external monitors or VCRs for viewing and recording. You will find full details of the connections in the manual. *Do not* attempt to connect your Amiga to this connector – otherwise you risk frying your machine.

The KEY IN connector is for connecting an external key signal into the RocGen, or more specifically the KEY OUT signal from the new RocKey chroma keyer which you'll find reviewed in the Video section of issue 19 of *Amiga Shopper*. *GW*

FINDING INSTRUMENTS



I have just started out learning to write music on the Amiga and currently own *StereoMaster* and *OctaMED Professional*. I'd like to know how to isolate one particular instrument (eg drums, bass etc.) from a sample of music that contains three or more instruments. Can I use the equipment I've got or would I need to purchase more software or hardware?

Also can you explain to me the difference between RAW, 1,3, 5 Octave, etc.?

Steve Collins
Chigwell
Essex

Separating the component waveforms of each instrument is, to all intents and purposes, impossible. What you should be doing in most cases is sampling individual instruments and then using them as the 'instrument basis' of your songs.

A RAW sample data file is essentially a copy of the sound data as it appears in memory. The 1, 3 and 5 octave files that you mention are different types of IFF 8SVX format sound files. *PAO*

FUJITSU DRIVER



I own a Fujitsu DPL24 (M3333B) printer for which I have not got a driver, and I don't know where I can get one. I obtained the printer second-hand when a firm was buying new stock. At the time I owned a C64 and was able to connect this up as a letter quality printer, but graphics were not available.

I have since bought an Amiga 500 under the impression that a driver would be available for it. I have been in touch with Fujitsu UK who very kindly sent me the driver for the DPL24C, as mentioned in your last issue.

This turned out to be of no use as my printer is a 24-pin mono, and the driver is for a colour printer. I believe there is a PD driver for the DPL24L or DPL24I, but the PD libraries I have been in touch with do not know where to obtain it. Can you help?

J Walsh
Knotty Ash
Merseyside

Fujitsu made several versions of the DPL24; most had Fujitsu's implementation of an IBM emulation built into them, but some emulated the Diablo 630 and some the Epson FX (a 9-pin printer). The DPL24C driver that Fujitsu sent you should work with the mono model as well, unless it has one of these older emulations.

The thing to do is phone Fujitsu Europe Ltd (☎ 081-573 4444) and ask to speak to Chris Barclay or Ray Friend, who are the Amiga boffins there. Be near your printer when you phone because they'll ask you for a 14-digit model number. *JW*

DISPLAY CORRUPTION



My B2000 includes an A2320 display enhancer and an NEC 3D multisync monitor running WB2 supporting ECS. Why, when I try using a super HI RES interlacer screen do I have to switch off the display enhancer to stop the corruption of the display (namely the fonts) and thereby introduce the dreaded interlace flicker? The A2320 user guide states that the corruption is due to the board sampling only every other pixel. Is it possible to get a non flickering super hires interlaced screen without a distorted display?

Thierry Leung, Frogmore, London

At the moment, no. Standard Amiga hi-res has a pixel speed of 70ns (a new pixel is displayed every 70ns). With Super-Hires the pixel size is halved so pixels are displayed every 35ns. So the display enhancer would have to work twice as fast to capture the information into its RAM (which would have to be twice as fast and far more expensive). But I have heard rumours that a new version of the Microway Flicker Fixer will be out soon which is capable of 35ns de-interlaced displays and will handle the Super Hires mode. *JR*

HOT PROPERTY



Further to recent letters in Amiga Answers, I am considering the purchase of an A-Max II Macintosh emulator, though I might wait for the Plus version to be released. Having contacted local suppliers and spoken to Silica technical support, it still does not seem possible to get a Mac emulator working as nobody seems to be able to supply the 128K Mac ROM chips mentioned in the Silica catalogue and your answer to D. White (*AS* issue 14).

When I contacted a local Macintosh supplier, they refused to supply the chips and suggested that they are actually impossible to obtain as they are protected by license. Please help.

Mr S.Hirst
Sheffield

Obtaining Mac ROMs for any purpose other than replacing an existing set inside a real Macintosh can be something of a frustrating task. This is a deliberate move instigated by Apple to clamp down on emulators which they see as just another form of cloning.

It is possible to obtain ROMs though through Meridian ☎ 081 543 3500. They can also sell an A-Max II or an A-Max II Plus, complete with the ROMs pre-installed. *JH*

HOME GOALS



Firstly, let me say that I am totally illiterate in the world of computers but have taken a great interest in the visual side of computer graphics as it occasionally touches my work in the decorative arts.

Over the past few years the effects which can be computer generated have been simply breathtaking, although they seem to me to lack direction and do not cross over successfully into the world of fine arts. They simply seem to run side by side on a parallel course.

One aspect of this is computer games, where I feel the graphics are totally artificial and unrealistic, with no depth of humanity. This may sound very grand, but it is fundamental to human enjoyment. Take for example the simple game of football, which is played in all weathers and contains all the wellsprings of human emotions not only in the players but also in the spectators. This is the area that could be developed into something vastly superior if graphics were to be more influenced by the fine and decorative arts.

For hundreds of years, artists and sculptors have been using and developing perspective, moods, feelings, colour, light and shade, etc to convey the human emotions. At the present time, computer-generated images, although they may look 3-dimensional and real, lack these emotions. This is the area that particularly interests me.

Having been totally confused by the proliferation of computer magazines at WH Smiths I closed my eyes and picked one. It was *Amiga Shopper*. After reading through, I decided that you would be the person to write to.

Could you put me in touch with someone in the computer field who may be in sympathy with my views/ideas and with whom I could collaborate to rocket computer graphics into the next millennium?

Stephen Harvey

As Clement Greenberg, the American art critic said, "All profoundly original work looks ugly at first."

JARGON BUSTING • JARGON BUSTING

ECS - Extended Chip Set is the name given to the new versions of the Amiga's custom chips which handle graphics and sound.

IFF – Interchange File Format is a means by which data from different graphics or sound sampling programs are saved in a compatible way. It allows data to be exchanged between programs very easily and avoids the situation on, say, the PC where dozens of different packages each save data in incompatible formats.

Printer driver – a program that sits inbetween any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for a specific printer.

Sample – a digital – computerised – representation of a sound. A sample can be sent through a digital to analogue converter (the Amiga has four of these) and be heard as sound. Changing the speed at which the sample is played back changes the frequency (or pitch) of the sound.

JARGON BUSTING • JARGON BUSTING

Accelerator board – a device which either includes a central processor like the Amiga's, or a more advanced one in the same range, but operating at a higher speed. An accelerator is useful for calculation-intensive applications, such as 3-D rendering.

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

RAM – Random Access Memory, so called because any part of it can be accessed immediately, rather than having to search through from the start of memory to the point of interest. RAM is used to hold programs while they are being executed and temporary data. The contents of RAM are lost when the power is switched off.

RAM buffer – a temporary storage area placed between a program sending data and a device receiving it. It means that the sender and receiver do not have to be working at the same speed, and that the sender isn't tied up waiting for the receiver to finish processing the data it already has.

SCSI – Small computer systems interface is the standard used for connecting hard drives, CD-ROM drives and tape back-up units to computers.

Computer art is in its infancy – not much past the cave-painting stage really, in terms of relative development. Fine art has a much longer evolution, a different set of hardware – how often does a paintbrush crash? – and a different set of aims. Many "great" artists were considered to be dreadful in their own times.

But seriously, I'm not really interested in arguing about good or bad in art – ultimately it's down to personal choice and that's all, even with the best "education" we'll never all agree about "taste", which is often dictated by financial, rather than artistic, considerations anyway.

Anyone interested in getting in touch with Stephen to discuss his ideas or compare notes could try writing to him at 15 Deepwell Close, Isleworth, Middlesex. ***GW***

MISSING MIDI

I use my Amiga mainly as a MIDI sequencer and very good it is too – nearly! The problem is that when receiving MIDI data the computer misses the odd bit producing a MIDI error and leaving a note hanging on (not very good for live work). I don't think it is my master keyboard (M1-D10-K4) as when going thru the MIDI interface directly to a module, it's fine. I also don't think it is the software as the same problem occurs with both *Music X* and *Sequencer One*.

M Kealy,
Edgbaston

I suspect you are right in thinking that this problem isn't connected with your keyboard or sound modules and I'm sure that more experimentation will eventually solve the problem. Does the error occur in real time, ie when you are echoing data back to the sound modules as you play, or is it restricted to times when you replay sequences that you have previously recorded? If it does occur in the latter case, is the error repeatable – does the *same note* get stuck? Is the problem more prevalent when you are replaying lots of tracks, ie have a lot of MIDI data flowing down the line? If it is then this might suggest that the fault is due to 'MIDI clogging'.

I assume you've checked all your leads/connections. Possibly there may be a fault with the Amiga's serial port but to be honest I doubt it. The fact that the interface works OK when linking your synth to a sound module doesn't necessarily mean that it will be working fine when a lot of data is being pumped through it and, at the moment, I must admit that it is the MIDI interface I suspect. My next step would be to borrow another interface (preferably not the same make) and check your system using that. ***PAO***

WORK WHILE PRINTING

I am fed up waiting for printouts from my Star LC-10 and would like to continue working in *Professional Page* while it is printing. Is there a software printer buffer for use with *Professional Page*? I am sure this would be a relatively simple task considering the device-based nature of the Amiga.

Robert Read
Sunbury-on-Thames
Middx

Yes there is. It's called CMD and it's in the Utilities drawer on your Workbench 1.3 disk, or in the Tools drawer on Workbench 2.04.

CMD redirects printer output from the PRT: device to a file, either on disk or in RAM. To use it you would double click the CMD icon, after which the very next thing you print gets sent (by default) to "RAM:CMD_File". If you want to change the device and/or filename, then alter the icon's "FILE=" Tool Type to reflect the device and filename you require – change it to "FILE=DF0:PPageSpool" for example, to save the file under the name "PPageSpool" on to a disk in the internal drive (DF0:).

CMD can also be used from the command line; type CMD HELP for a brief run down on the syntax and options that can be specified.

After the file has been saved to disk or RAM, you need to use the Copy command to send the file to the printer, via the parallel device PAR:, not the PRT: printer device. So the command would look something like ...

```
Copy RAM:CMD_File TO PAR:
```

And while the Copy command is printing your page or pages, you can go back to *Professional Page* and continue working.

Keep in mind that you'll need a fair amount of spare memory if you are going to spool to RAM:, and that the 'printer' file for some pages or documents may be larger than can fit on to a floppy. I see you've got 2Mb at the moment, I'd recommend at least 2Mb more. ***JW***

XT DRIVES?

I currently have a 20Mb SCSI drive fitted in my A590. Is it possible to change this for an XT drive and then daisy chain the SCSI drive on? (Speed is not of particular importance as most stuff will be crunched). What type of XT drives are usable in the 20-40Mb range (IDE? MFM?). I think it's possible to set a delay on a SCSI drive so that two drives don't power up at the same time. If this is so, can two drives be wired to the same PSU (as power needed after power up should be minimal)? I read in a PD mag somewhere that it is possible to increase the memory capacity in an A590 beyond the 2Mb limit. The article mentioned that the board has to be a 'series II' but mentioned nothing about the chips.
a) Is the above correct?
b) How do you spot a 'series II' board?
c) What type of chips are needed?

Colin Smith
Denny
Stirlingshire

It's possible, but not worth while. Commodore stopped using XT drives because SCSI drives are now cheaper than XT drives. Most XT-IDE drives we have tried do not work properly in the A590: there are no such problems with SCSI drives. I would suggest getting an external SCSI drive and leaving the SCSI drive that you have in the A590.

As far as I know you can't fit more than 2Mb of RAM inside the A590. ***JR***

IN PRINT – FAST

I am considering investing in a new printer and also an accelerator card. I would therefore appreciate your help in making the right buying decision.

On the printer front I have only been able to look at reviews in a rival magazine and would therefore prefer your opinion on my selections. These are the Canon BJ10ex and the HP DeskJet 500. The difference between these two printers works out at around £70 and I would like to know which one you consider to be the better bet. How do the two printers compare in terms of availability of printer drivers, quality, speed and maintenance costs? Is the HP really only a DTP printer or is it worth paying the extra cash for the uses that I will be putting it to – namely letter writing, CVs, listings etc?

My second concern is over accelerators and the anticipated new range of Amiga computers. I intend to buy a SSL A5000 with a 20MHz 68882 and 1Mb of 32-bit RAM. I am wondering whether I should buy this now or put the money towards an A800 with a 68020. If I buy the accelerator, would it be compatible with the new 68020-based Amiga assuming I upgraded the Kickstart etc? I know that it is unlikely that you can answer this question now, but I'd appreciate your thoughts on the matter.

Whilst I'm on the subject of the new machines, will the new A800 have an A500-like bus connector or an A600 ROM card slot? If Commodore go for the ROM card slot, this will mean that I will have to sell my hard drive. Please help.

David McGuire
Cumbernauld
Glasgow

The most popular Amiga printers come in basically three flavours – dot matrix (9 and 24-pin), inkjets (and Bubblejets) and expensive lasers. The two printers that you mentioned are actually inkjets which, in my opinion, are the best of the three in terms of print quality and value for money. Having just completed a very comprehensive round up of printers for *Amiga Shopper's* sister magazine *Amiga Format*, it came as quite a

shock to me that people are still buying dot matrix printers at all when inkjets provide considerably better results for pretty much the same amount of cash. OK, an inkjet is more expensive to run, but the difference in print quality is astounding.

If I has to choose between the two printers that you have selected, I would go for a Canon, although I would probably not buy the BJ10ex. A much better bet is the Canon BJ20 which is basically a BJ10ex with a cut sheet feeder as standard, but it also comes with more fonts than the basic BJ10ex. Not only that, but it also works out cheaper to buy the BJ20 than to buy the BJ10ex and cut sheet feeder separately. In terms of print quality, the BJ20 (and BJ10ex) actually produce better results than the DeskJet, especially when used with Canon's own Amiga printer drivers. There isn't actually a decent DeskJet printer driver available, so you'll never be able to use the DeskJet to its full potential.

The A800 is still very much 'vapourware', so it's difficult to offer any details about it. Fitting your A500 with an A5000 board will actually make the machine run much faster than a straight '020 Amiga, so speed is not really the question here. If the rumours are correct, the new Amiga will be technologically more advanced than current Amiga models thanks to the new AGA chip set and its full 32-bit architecture. At the end of the day it's up to you – if you plan to upgrade simply for the faster processor, then go for the A5000. Personally though, I'd go for the A2200.

Although nobody has yet seen the specification of the new machine, I think we can be pretty sure that it won't have an A500 bus connector but will come with an A600 ROM card slot. Commodore is trying to push the ROM card slot heavily, so it would seem logical that all new machines would come with this facility to increase the market for third party ROM card products. ***JH***

CONFUSED OF WALES!

I have a well-configured Amiga 2000 which I mostly use for video graphics, titles and animation in a high-band U-matic edit suite. I use the latest versions of *Scala* and *Dpaint IV* and I've noticed that *Scala* loads an animation much faster than *Dpaint IV* does. Why is this? How can I make animations play back in *DPaint* at the same speeds they do in *Scala* – ie quicker?

I'm also very confused about what I need to do to add more Chip RAM to my Amiga – as *DPaint* sometimes says "Not enough memory for operation". Do I need *Workbench 2,* a 2Mb Agnus, a Super Denise chip or a MegaChip from DKB? Writing or phoning many advertisers has left me bewildered as to what I really *need* and not what they want to *sell* me.

Norman Meyer
Llanboidy
Dyfed

Well, you're certainly right about the speed differences in animation playback. Scala UK tell me this is because the *Scala* program optimises the use of the *Anim5* format, while *DPaint* doesn't. I also know that the PD program *View 3.0* plays back anims much faster than *DPaint!* As for the 2Mb Chip RAM problem, the only way to fix this at present is to add the DKB MegaChip 2000, which is a small circuit board built to carry the 2Mb Agnus. You can get one from MicroPace (☎ 0753 551888) in this country for £210, or from GrapeVine in the USA. I'd also suggest upgrading to *WB2.04,* as you'll soon realise the benefits of its improved functions and stability. ***GW***

C MANUAL

Can you tell me how to print files on the C manual PD disk. I have tried using *Notepad* and *Prowrite* but this doesn't work. In the *Amiga C For Beginners* book it says 'Start the Lattice compiler with the command 'lc -L hello'. When I create the hello.c demo program and type the lc command into a Shell window I get the message lc "unknown'! I get similar messages with *Aztec C.* Can you tell me what the problem is?

Anonymous
Tyne & Wear

You need to use an editor that can read/write ASCII text files of any length - ED or MEMACS (which is on the 1.3 extras disk) will do the job. Your C troubles are due to environment problems – basically *Lattice* and *Aztec* are failing to compile your example because *AmigaDOS* is looking in the wrong places for the compiler tools.

Lattice ,for instance, expects a number of assignments (LC, INCLUDE, LIB and so on) to be in place. Both the *Lattice/SAS* and *Aztec* compiler manuals will explain the nitty gritty details for you. ***PAO***

CHIPPED CHARACTERS

I am using *PageSetter II* with a Canon BJ-10e printer. I have one external floppy drive and a Virgo V4000 RAM expansion, giving me a total of 1Mb Chip RAM and 3.5Mb Fast RAM.

My problem is that when I try to print out 127pt characters at 360 dpi, only part of some of the wider characters are printed. The characters appear perfectly formed on the screen, and if I print out at 180 dpi the characters also appear perfectly.

I wrote to Gold Disk. They said that problem was because I do not have enough Chip RAM and that if I fitted more the problem would go away. But I can only fit a maximum of 1Mb Chip RAM in my Amiga 500. Help!

Ian Avery
Hitchin
Herts

I think it's true that the problem is Chip RAM related. I remember when I moved from a 512k Chip RAM machine to a 1Mb Chip RAM machine this notorious 'bits missing' problem wasn't as bad as it had been before, and I certainly haven't have this problem running *PageSetter II* on the 2Mb Chip RAM Amiga 3000.

The higher the resolution you print at, the more contiguous memory is required to form the image, and for various reasons (mainly speed) *PageSetter II* uses Chip memory for printing. I found that with 1Mb Chip RAM if I stuck to 90pt and below, bits rarely went missing, but it depended on which typeface I was using, which suggests that there may be a problem with AGFA's Compugraphic format as well.

Sometimes it helped to defragment memory by re-booting the machine, running *PageSetter II,* loading and printing the document again. It also helped to save a many-page document into single pages and load and print them a page at a time, re-booting between pages where necessary. I find that moving in and out of different levels of magnification fragments memory quickly, and so does flipping between interlace and non-interlace, and wireframe and non-wireframe. ***JW***

TAPE BACKUP

I have a tape backup drive from a PC and wish to connect it to my Amiga. The drive is a Compaq/Irwin magnetics, and I think it just plugs into a normal drive bay in the PC. It has a standard 4-pin power connector, and two edge connectors, one with 11 contacts on each side and the other with 17 contacts per side, one side being grounded. I do not have the pin-outs but I would imagine it would be standard. Could I connect it to the Amiga, either via the internal SCSI port, or as another drive and would I be able to use the *Quarterback 5.1* tape backup utility with it.?

James Darling
Whippingham
Isle of Wight

The connector you describe is not a SCSI connector, so the tape drive will not work with the Amiga at all. You can now pick up SCSI tape drives quite cheaply, make sure that you get a SCSI drive – nothing else will work with the Amiga. ***JR***

PACKED PICTURES

Can you tell me how to 'archive' an IFF picture file such as those produced by *Deluxe Paint?* Could compacted pictures still be viewed using a program such as *VILBM*?

DG Clarke
Brentwood
Essex

It's not usually possible to view a compacted image file unless the utility you use to view that file has been specifically written to automatically decompact the file. One such program that will do this though is *PowerPacker 4,* a file-cruncher program which comes with a *VILBM*-like utility called *PPShow* which can display image files packed using *PowerPacker.* ***JH***

CPC PROBLEM

A few issues ago you printed the connections for hooking up an Amiga to an Amstrad CPC 464 colour monitor. I made up the lead exactly as shown but I only ever got a very poor, badly coloured and out-of-shape picture. A friend of mine suggested that a resistor may be required on one of the pins. Both the Amiga 500 and CPC monitor work fine separately, so do you have any advice?

Cpl McFegan
RAF Bruggen

I don't recall needing to add a resistor when I did this a good while ago, but I can't verify it anymore as my old CPC464 monitor went pop some time back.

One thing which wasn't made clear in the original answer was that the RGB connections should be the analog ones from the Amiga, not their digital counterparts.

For £6.98 + 90p p&p, Meedmore Ltd (28 Farriers Way, Netherton, Merseyside, L30 4XL ☎ 051 521 2202) can sell you the proper lead for the job. Note that this price applies to BFPO addresses only, since VAT doesn't apply in this instance. ***GW***

UNSQUISHING FISH

I recently bought the Fred Fish disk *PCQ Pascal* compiler but the compiler is compressed.

How do I decompress the compiler and use this program ?
Michael Hanafin

Tralee
Kerry
Ireland

To decompress the files you'll need to boot up from your Workbench disk and open a CLI/Shell window. Having done that you have got to execute the *lharc* program and, since you only have a single-drive machine, the unpacking process is more complicated than it would otherwise have been.

The best idea is to copy the commands 'copy' and 'dir' (and any other commands you think you will use) from your Workbench disk to the RAM disk and then make the RAM disk the current directory (using the cd ram: command). Having done this you'll be able to take out the Workbench disk, insert the PCQ disk, and then copy lharc *and* the archived files to RAM:.

You'll then be able to insert your destination disk and de-archive the files that you've placed in the RAM disk. To de-archive the file source.lzh, for example, you could use the command...

```
lharc -x -a -m e source.lzh ↵
df0:
```

Typing lharc without any options will, incidentally, give you a list of other archiving and de-archiving options. As far as using a C compiler is concerned you have a lot of work ahead but a good starting point is to print out, and read, all of the documentation files which are provided. They won't all make sense but read the introductory sections and then start looking at some of the simpler C examples which have been provided. ***PAO***

MULTIPLE COPIES



Following your recent tip to print to the RAM disk via CMD I printed a page from *PageSetter II*. My problem is how to obtain multiple copies of the CMD_File without resorting to typing in the Copy command several times.

Is it possible to set the Canon BJ-10ex printer to print more than one copy of a document?

Ian Fereday
Great Houghton
S Yorks.

No, the only way is with multiple Copy commands, or an *AmigaDOS* script that contains multiple Copy commands. ***JW***

DELL MONITOR USAGE



I have a Dell VGA colour plus monitor and I'm wondering if I could connect it to my Amiga with some sort of lead?

There is a lead coming out from the monitor with a 15-pin socket, if it's any help.

Paul Grave
Fort William

JARGON BUSTING • JARGON BUSTING

Assembler – a program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine.

Genlock – a way of slaving one video source (eg Amiga) to another (eg video tape) in order to synchronise their signals to allow stable wipes, mixes and other effects including overlay between the two sources.

Pascal – a structured programming language developed by Nicklaus Wirth.

VGA – Video Graphics Array. High resolution colour or monochrome graphics system for the IBM PC. 80 columns by 25 or 50 line text and a huge range of colours; sometimes 256 at a resolution of 1024x768.

You will need some form of flicker fixer, such as the ICD Flicker Free Video card, to use a VGA monitor with your Amiga, and then only if the monitor is capable of a 50Hz display. Check with Dell if the model of monitor you have is capable of 50Hz Vertical Sync. If it is, you will still need the ICD card or equivalent to link your monitor to the Amiga. If your monitor can't run at 50Hz sync then unless you fix your Amiga to run permanently as an NTSC machine (with smaller screen size which won't run all UK software), then you can't use the monitor. ***JR***

GENLOCK GEN



Please could you tell me which is the best genlock for picture quality and also the best value for money? It must have S-VHS connectors and work with my Amiga 500 Plus.

RS Raju
Bradford

Here is another question which is based on cost versus quality. But at what cost? I could say that a £1000 genlock is good value for money, as well as good quality, but it may be a pointless answer because it is outside your budget range. Please, at least give me some indications of what you can afford to spend when you ask a question like this one. ***GW***

THROATY SAMPLES



I have got *OctaMED Pro, Sequencer One,* and *SoundStudio* (public domain), and a Casio MT-64 keyboard and want to get into MIDI and sampling. I would like to do things such as make a noise like a cough and play it back at different pitches, and use the rhythms on my keyboard. Apparently I need a MIDI interface and a sampler. Could you answer these questions for me:

a) Do I have all the software I need?
b) I have a printer in the parallel port - will this cause problems?
c) I have a 1Mb A500. Is this OK for what I want to do?
d) Can I connect my electric guitar to my Amiga?
e) Do you know of a good MIDI/sampling book?
f) Is my Casio MT-64 suitable for what I want to do?
g) Can I get a combined sampler (with microphone socket) and MIDI interface for about £40, and can you name a good one?
h) Is sampling and MIDI worth the trouble?

Moushumi Saha
Wimbledon

a) You've certainly got quite enough software to get started!
b) Amiga samplers attach to the parallel port but this just means that you'll have to unplug your printer when using the sampler.
c) A lot of musicians do great stuff with just a 1Mb Amiga.
d) Guitar pickups do not usually provide a sufficiently strong signal for plugging straight into a sampler but if your guitar amp has an auxillary output with a reasonable signal strength, eg a headphone output, you'll be able to connect this your sampler and sample the guitar in this way.
e) Nowadays there are plenty of reasonable books and rather than me recommending one the best idea is to get down to your local music store and have a look at a few!
f) Yes.
g) No, so you'll need both. There are a number of MIDI interfaces around for under £20 and one cheap sampling package that I recently got very good results with is City Beat's Beat Studio (which costs £29.95). This is about as near to your £40 budget as I can get.
h) Very definitely yes – MIDI is here to stay. All musicians should know as much as possible about it. ***PAO***

BACK TO THE SYSTEM



I am having a great deal of trouble with a small assembly language program that I am writing. The program is based around stuff in the Abacus *System Programmers' Guide*. I am using *DevPac 2* to write it.

The program works fine; it is returning to the OS that I can't seem to do properly. When I use INCBIN to get a file into my program, the thing won't run after being assembled a few times. This also happens if I use the SECTION directive to get my data into Chip memory. The Abacus books use the operating system calls AllocMem() and FreeMem() to request Chip memory. This works fine when returning to the OS, so I imagine I am disrupting the system memory management with the way I am trying to do it. I have followed the program in a monitor, and it is failing with the memory requests from the OS. When using INCBIN or SECTION isn't the OS given a way of releasing the memory requested? If so, what am I doing wrong?

Another problem with an extension to this program is the interrupt to play a *SoundTracker* module. I can get the program to work, but the computer locks up afterwards. Do I have to use an OS routine to do this?

Also I am about to begin a BTEC Computer Studies course. The programming languages used on this course are Pascal and Cobol. I have not heard of a Cobol compiler for the Amiga; do you know of one?

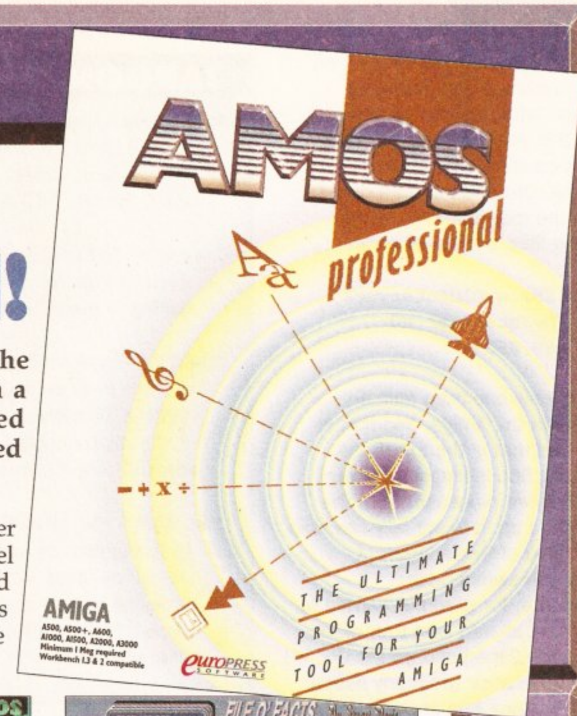
Andy Powel
Sarisbury
Hants

The Abacus *System Programmers' Guide* is rather guilty of teaching some extremely bad programming habits. I would strongly recommend that if you are able to afford Commodore's official offerings that you buy them as soon as you can.

I would suspect that your memory problems are related to fragmented memory maps. The best way to avoid this is to reduce the requirements your program has of single large chunks. I would certainly discourage using INCBIN to include large files, such as soundtracker modules and graphics. It's *much* better to reduce the size of your executable program as much as possible and allocate memory from within the program and use DOS to load them in. Also, SECTION is a good thing to use. Separate functional parts of your programs with SECTIONS, and group all data variables together in a DATA section. When your program is then loaded in, AmigaDOS is more likely to be able to load it into a fragmented memory map as it is now lots of little bits rather than a couple of real big ones.

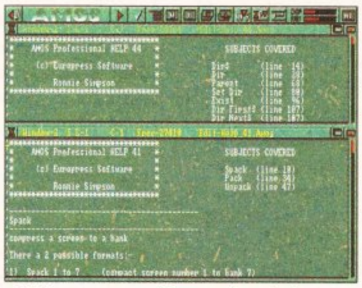
Your interrupt routine is deadly. Its certainly no surprise that you have had problems with it. You are right, you will have to use the operating system for this one. The overhead is little, and the result is that your program is more legal,

Now AMOS has turned Professional!

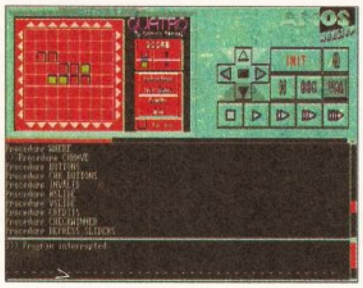


AMOS The Creator has brought programming within the reach of over 50,000 Amiga users. Now it has been given a complete overhaul and the result is a vastly enhanced product – AMOS Professional – designed for all experienced Amiga programmers.

AMOS Professional has 200 new commands, taking the total to over 700. Included in the package is a 650-page manual written by Mel Croucher who wrote the highly-praised Easy AMOS manual, and Stephen Hill who wrote the original AMOS manual. Programs written using earlier versions of AMOS and Easy AMOS can be loaded into AMOS Professional for amendment or enhancement.



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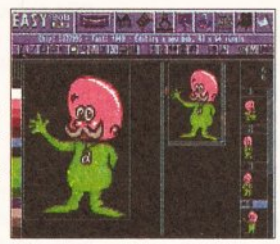


You can get serious too – File O' Facts shows just what's possible

- On-line help provides details of the command at the cursor position – another click takes you to a fully documented working example.
- A new editor with drop-down menus, keyboard macros, advanced undo/redo, and multiple windows on screen.
- IFF animation playback that runs faster than in DPaint.
- MED music library support with MIDI data send, Noise Tracker support, easier access to the printer, serial and parallel ports and much more.
- MOUTH commands to link sprites to speech output from the SAY command to create a realistic talking head.
- Two discs crammed with working examples, and tutorials demonstrating AMAL, the new AMOS Interface system, collision detection and other key topics.
- A selection of new highly-finished programs, including Planet Zybex (a scrolling shoot'em up), File O'Facts (electronic data organiser), Quatro (puzzle game) and Dithell's Wonderland (an eight-way scrolling platform game).

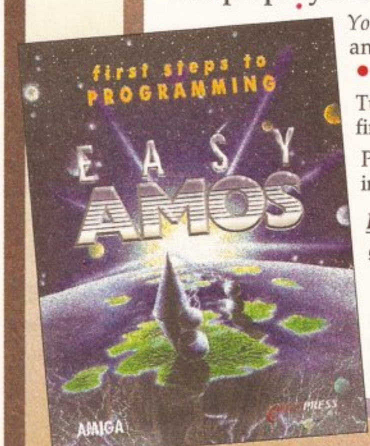
The result is a package which will more than satisfy home and professional AMOS users. It's fun to use, lots to learn – it's essential for the Amiga.

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reliable and more likely to work on future machines and operating systems. With interrupt routines of the kind in your program you can actually cause real damage, including corruption of hard drives. One of the root problems is the following little snippet of code:

```
move.l $6c.w,OldInterrupt
lea    MyInterrupt,a0
move.l a0,$6c
```

There is only *one* fixed memory location on the Amiga, and that is $04.L and that is the ExecBase. Accessing $6c is illegal. On every 68000 series processor from the 68010 and up, it is actually possible to MOVE all of those interrupt vectors somewhere else. Commodore, for example wanted to move them all into Fast RAM with *Workbench 2* to speed up the OS. It couldn't, because too many people were accessing $6c and the like. This sort of code *will* break on future OSs, and increasingly people are running go faster utilities which move things like the Vector Base Table into Fast RAM. Also, by stealing this interrupt, you are starving the OS of possibly essential information, and this can cause the OS to lose or corrupt data – something you don't really want. Its not really more complex with the OS:

```
InstallVertB:
    move.l Interrupt.VERTB,a1
    lea VERTB_Name(pc),a0
    move.l a0,$0a(a1)
    ; Set server name.
    move.b ↵
#NT_INTERRUPT,$0a(a1)     ; ↵
Set type.
    move.b #15,$0b(a1)     ; ↵
Set priority.
    lea VerticalBlank(pc),a0
    move.l a0,$12(a1)      ; ↵
Set address.
    moveq  #INTB_VERTB,d0
    SYS AddIntServer        ; ↵
Add the interrupt server.
```

This will add the routine "VerticalBlank" as the vertical blank routine with a priority of 15. The joy of this procedure is that your routine no longer needs to return with an RTE, as the OS will handle all of that itself. It sorts all the interrupts and only gives you the one you wanted.

JARGON BUSTING • JARGON BUSTING

Agnus chip – the custom chip dedicated to graphics. The first three versions – 8361, and the 8370 and 8371 Fat Agnus – can access 0.5Mb of Chip RAM. A later version, 8372a, can access 1Mb; while the ones used in A500 Pluses, A600s and A3000s can access 2Mb.

C – a compiled language designed primarily for systems programming. It was used to write much of the Amiga's operating system, and is used in the writing of many Amiga applications.

CD-ROM – Compact Disc Read Only Memory is the latest technology in storage devices. A CD can hold over 550Mb of data, compared to around 100Mb for a hard disk and 880K for a floppy disk. The big disadvantage is that users cannot store information on a CD, only retrieve it, but this doesn't stop CD from being a potentially revolutionary medium.

Chip RAM – the area of the Amiga's memory directly accessible by the custom graphics and sound chips. Originally a maximum of 512k, newer machines fitted with the fatter Agnus graphics chip can access 1Mb, enabling smoother animations and more screens to be displayed at once. The new A600 comes with an Agnus chip capable of addressing 2Mb of Chip RAM.

Your routine would be called for every level 3 interrupt (currently there are 3). The one above is only called for the vertical blank one. This is all documented in the *Libraries Book* (Edition 3).

Finally, I am afraid I don't know of a Cobol compiler anywhere. Its certainly not a very widely used language these days, even in industry its slowly dissapearing in favour of Database languages. ***TS***

BJ ITALICS WANTED

I own a CDTV and the Canon BJ-10ex printer, which I use with *TextPlus2*. The problem is I can't get italics to work. I've used the generic printer driver, Canon's official printer driver and the shareware Canon48 driver, all with no luck.

***Notepad* is the only program that outputs graphics. I hate *Notepad.* All I want is italics, what do I do now?**

Mark Smith
Liverpool

The BJ-10ex contains two emulations, IBM and Epson. Note that I'm talking about the BJ10ex here, not the BJ-10e (without the 'x') which has only IBM emulation.

To use the Canon driver you need to be in IBM emulation, which is what you are doing at present. The trouble is that this particular IBM emulation does not have an italic character set. The reason *Notepad* prints italics is because it is doing a graphics printout (or a 'screen dump' if you like) using the low resolution screen fonts, which is why the output is all jaggy.

To get the printer to use its own internal italic character set you should switch the BJ-10ex into Epson mode by altering the configuration of the dip switches. The printer manual will tell you which ones; I believe it's switches 10 and 11 in the second bank of switches.

Then you need to use an Epson-compatible printer driver instead of the Canon driver, which only works in IBM mode. The best one on the Extras disk is Nec_Pinwriter. ***JW***

ACCELERATOR ANGST

Please could you tell me if card-based accelators will function correctly in my machine. There have been rumours that the co- processor slot in the Rev A A2000 was wired differently from the one in Rev B machines. Is this true? Does this mean that I would have to go for a surface 68000 socket mounted accelerator like the VXC-30 instead? As to the timing errors which were supposed to happen in the Rev A machines (I do not have any timing errors at all) Rev No 4.0 does not have timer errors, but I have found that Rev 4.5 does, so watch out all you would-be second hand buyers!

Stephen Swales
Sunderland
Tyne & Wear

You can use the Commodore accelerators (the A2620 and A2630) without problem in your machine, except you will have to remove the 68000 from its socket. The installation procedure is explained in the manuals for the two cards. I don't know if any other accelerator cards will work in the old German A2000s. ***JR***

INFLATION AND BUBBLE REFILLS

I'm using a Canon BJ-10e bubble jet printer, and I'm finding the replacement ink cartridges a bit costly. In issue 13 you answered a query from CR Thorpe of Wallasey in which you said there are firms that sell cartridge refill kits. Could you please give details of where to buy these kits?

Danny Mistry
Evington
Leicester

There are quite a few companies selling these bubble jet and inkjet refill kits now. Try INMAC on ☎ 0928 579000, Rodesign on ☎ 0279 444313, or Systems Insight on ☎ 0707 276913. ***JW***

NOT SO SUPRA

My problem is with the Supra 500RX expansion RAM. The problem appeared when I tried to mount a little RAD: to store some data (no boot). When I mount the RAD: everything is OK, and I can read/write to the RAD: with no problems. But when I boot up the computer and Workbench reloads (from disk) the RAD appears normally, but the data stored on it is corrupted. If I switch off the SupraRAM, boot and mount the RAD (i.e. forcing RAD to place in Chip RAM) the RAD has no problems. Obviously the problem is in the SupraRAM.

I have tested the expansion RAM a lot of times (with the test software supplied by Supra) and I never get errors. In normal use the RAM works fine (*Real 3D* demo, large animations or a very large RAM disk cause no problems at all.)

After some very hard mind-crunching I have done some test to the RAM. I switched off the RAM (i.e. turned to the test mode), and then, with a machine-code monitor, I have filled the RAM with the byte FF (the board remains placed at address $200000 in test mode, i.e. in test mode the RAM just doesn't join to the available memory list but it autoconfigs normally). After the reset I looked the RAM and I found that the data was (very) corrupted. Longer reset times means more corrupted data. Definitely the problem seems to be that no refresh is done in the time that the reset keys are pressed. I suspect that the board uses some signal from the computer for timing the refresh that stops when reset keys are pressed. In run mode everything is the same.

Is my board faulty?

Antonio J Pomar Rossello
Palma De Mallorca
Spain

This definitely sounds like a fault with your hardware. Whether it is a design fault or a problem with your particular unit I do not know. If you run system/NoFastMem before you mount RAD: then it will mount into Chip, and should stay there after a reboot. ***JR***

C SOMETHING SIMPLE

At college I wrote a simple program...

```
/* Join Twostrings */
#include <stdio.h>
main()
```

```
{
static char flower[80];
static char addon[] = "s ↵
smell like old shoes.";
puts("What is your ↵
favourite flower?");
gets(flower);
strcat(flower,addon);
puts(flower);
puts(addon);
}
```

Using Zortech C on an IBM it worked fine but with SAS/C on the Amiga the first puts() is ignored until after the gets() function so the output lines come out in the wrong order. What has happened?

Eric Patterson
Wembley

I didn't run your program but I do know what is causing the problem – the puts() output is being buffered rather than immediately sent to the screen. Try putting the statement:

```
fflush(stdout);
```

immediately after your puts() lines – this will force any buffered character output to be printed and your program will then work as expected. ***PAO***

ROM SELECTION

I am thinking of putting in a 2.04 ROM chip. Will I have to chain the selector switch and the Zydec Ram chip switch together so as to disable the 1.5Mb Zydec Ram when using WB2? I have heard that these boards connected to Gary will not work with WB2. What would be your suggestions about adding an accelerator board?

Chris Busby
Crawley
West Sussex

My advice would be to get rid of the Zydec board if it doesn't work with Kickstart 2 and get a better RAM board. You could look at getting an accelerator such as the Microbotics VXL-30 with RAM board, which gives you a second Kickstart socket for the 2.04 ROM plus room for more memory to replace the Zydec card. ***JR***

PIECES OF EIGHT

I have a few images saved in IFF format from my Power Scanner. My friend, who also owns an Amiga 500, has a copy of *PageStream 2.2.*

He told me I could get a much better printouts on my Citizen 120D+ by importing the pictures into *PageStream.*

I borrowed it from him but when I tried to import a graphic it said "Format not supported by modules". I have found them on the Drivers disk, but cannot use them through the program. Help!

David Hurst
Bolton
Lancs.

Ah yes, I know this problem. It's an illegal lending activity called software theft, popularly known as 'piracy'.

What you need are instructions that tell you how to set up *PageStream.* For that you'll need a manual. And to get a manual you'll need to buy a proper package. ***JW***

MORE CHIP RAM

I have read letters from people who have the same system as me, but have a configurable trapdoor RAM expansion to allow 1Mb of Chip RAM. If I swap my trapdoor expansion for a configurable one, could I enable 1Mb of chip RAM without having the motherboard conversion? Also, SysInfo says that my trapdoor RAM is "Slow RAM", why?

Graham Smith
Featherstone
West Yorkshire

You would not be able to do this unless you have the ECS Agnus chip, which in your case you do. Depending on the age of your motherboard, you may still need to make some alterations. Consult your dealer for further information.

Slow RAM is the name for the trapdoor RAM at $c80000. This is special memory which is controlled by the same hardware as the Chip memory. The result of this is that although technically it is not Chip memory, it suffers from Chip memory limitations, and slows down depending on what work you are doing. ***TS***

NO MORE MEMORY

I bought *Pen Pal* at the same time as my A600HD, because my mother plans to write a book, and I have decided to make a separate 2Mb partition so that all she needs to open is that partition if she is going to use the word processor.

My problem is that as soon as I attempt to import pictures, or as soon as I attempt to perform a spelling check, *Pen Pal* comes up with a message indicating insufficient memory.

I have tried to use *Pen Pal* from the floppy disk and have got the same results, but if I re-boot with the *Pen Pal* disk in the drive, a *Workbench 1.3.2* system gets loaded and everything I have attempted to do so far has worked – I have imported two pictures into the tutorial with no problem at all.

The supplier of the kit says it is my fault that the problem exists because of the extra partition on the hard drive, as it takes up about 20k of memory. But why does the system work when the old version of Workbench is loaded?

My options appear to be remove the partition, which will give me an extra 20k of memory, or to buy a memory expansion as suggested by the supplier. Neither of these options appeals to me, especially the latter. Are there any other answers?

B Darch
Yeovil

When *Workbench 2* is booting from your hard disk it runs a few programs that *Workbench 1.3.2* doesn't. With enough memory, these 'extras' much improve the working environment. But with only a little memory they restrict what you can do, and this is the situation in which you find yourself.

In truth your supplier has not told you a lie: the best option would be to buy a 1Mb memory expansion. Even under *Workbench 1.3.2,* 1Mb is precious little memory to work with, especially for any activity that involves importing and printing graphics.And the 2Mb hard drive partition is probably unnecessary. Why not have the one big 20Mb partition and simply create a drawer called MUM and put *Pen Pal* in there? That way your mum's got her own little drawer on the hard drive and you've clawed back that 20K. ***JW***

CHIP RAM CONTRACTION

I have got an A500 rev. 6a with a Fat Agnus (1Mb) and with a Zydec 1.5Mb Ram expansion. But when I make the changes to make it 1Mb Chip RAM and 1Mb Fast RAM as you told in *AS* 14 page 24 the computer won't boot. The power flashes and the screen flashes between white and grey. What am I doing wrong? And can you tell me where I can find a printer-driver for the Swift 24 colour printer?

Edwin de Koning
Enschede
The Netherlands

Most 1.5Mb RAM expansions do not work as 1Mb Chip RAM. Replace the Zydec board with a standard 0.5Mb RAM card and you should be OK. I am afraid I do not know of a printer driver for the Swift 24 colour printer. ***JR***

CDTV DRIVING

Is it possible to connect a standard SCSI hard drive to the CDTV? Also, is it possible to disable the CDTV ROMs, as when they are removed I can run any software that will run on an A500 configured to 1Mb Chip?

D Boland
Sheffield

Almathera Systems (☎ 081 683 6418) will have a SCSI card for the CDTV available soon for under £100. This will allow any external SCSI hard drive to be connected to the CDTV.

Unfortunately I've no idea if it's possible to disable the CDTV ROMs directly on the CDTV. ***JR***

RELUCTANT ICONS

When a *Workbench* screen is displayed with icons and an Icon is selected the pointer will freeze. If a disk is inserted it unfreezes. This means I can't drag icons. Also when I switch on my printer any disk I insert develops a read-write error. When I switch my printer off it doesn't happen again. I've had a new CIA chip fitted, but my mouse still freezes.

Richard Scothern
Grantham
Lincs

Your problems are definitely CIA chip related. It sounds like both CIA chips are faulty. It may be that one of your external devices is causing your CIA chips to blow up. I can't overstate how important it is to make sure your Amiga is turned off when you plug or unplug in external devices. If you've got a mouse with metal shielding around the connector, *never* plug the mouse in when the machine is in. This is one of the easiest ways to blow your CIA chips. If you have a Naksha mouse or similar with a 100% plastic plug, you can safely swap the mouse/joystick with the machine on. ***JR***

SHOPPING LIST

I am having difficulty choosing a computer system. I lack the expertise to make the right decision and would therefore be grateful if you could assist me.

I have a video camera and a four head VCR and I would like to be able to capture images from these and insert them in my letters. I would also like a colour printout and be able to record simple animations onto videotape.

•Will an Amiga 600 with 40MB hard

INTUITIVE AREXX

I have written a few small programs in *ARexx* and decided to get the Rexx Intuition library (Fish Disk 463) to allow me to use Intuition front ends in my programs. I dropped the library files into the libs: draw but when I attempt to run the demo examples I get 'Function not found' errors. I've tried placing the ADDLIB command into the programs but it doesn't make any difference.

Tim Reeves, Southend on Sea

I'm a bit stuck here because, having not actually seen the Fish Disk you mention, I have no idea what the demo programs contain. Before *ARexx* function libraries can be used it is necessary, as you indicate, to use the Built-In *ARexx* ADDLIB() function to get the library name added to the library list. Assuming you've done this properly, and provided the call with whatever offset and version data this particular library requires, you should then be able to use the library functions. Have a good look at the library documentation because it is just possible that the library's function name<->function remapping routine (which all *ARexx* libraries provide internally) is case sensitive - this would cause the problems you've encountered. Failing that, other than mentioning that as well as putting the library in the 'libs' directory you have to assign the libs: logical device to the libs directory of the disk in question, I don't know what to suggest. Perhaps the demo programs have assumed that the ARexx ADDLIB utility was used to pre-load the library? ***PAO***

disk do the job?
- **Can you recommend suitable hard disk backup software?**
- **If I have a hard drive, will I still need an external floppy?**
- **Will I need an extra megabyte of RAM?**
- **Does VIDI Amiga 12 work on the A600 and would you recommend it?**
- **Is the Star LC200 Colour a suitable printer?**
- **Can you recommend a suitable word processor? I hear Final Copy is good.**
- **Is there a dealer I can buy the whole lot from?**

I aim to spend approximately a thousand pounds, so could you provide a shopping list for me?

Once I have acquired the necessary hardware/software I need a way of connecting it all together. My video has a fully implemented SCART socket and I understand that Commodore monitors now come with a SCART socket. I'm not sure what connectors VIDI Amiga 12 has.

The Amiga output must go to the monitor for normal use and to the video for recording. The video output must go to the monitor for normal use and the computer for digitising. What leads are required to achieve this?

I would be very thankful if you could help me. I understand I have a lot of questions - but then it IS a lot of money!

Brian Ford
Luton
Beds.

An Amiga 600 with 40MB HD should handle your needs well enough, so long as you add more memory (preferably more than 1MB). I'd recommend *QuarterBack 5*, for HD backup, though a less friendly program (BRU) comes free as part of WB2. I'd recommend the extra drive if you regularly need to shift data between disks as it's easier that way, though one drive is by no means a problem.

Rombo say that Vidi Amiga 12 will work on an A600. I've not seen it yet, as I'm still waiting for a review copy, so I can't fairly comment.

Final Copy is fine, though it has one (perhaps slight) drawback in that it uses its own Outline font format, and cannot use any of the Compugraphic fonts which are available either as PD, from Agfa, or with WB2 - though with 10 good fonts provided you should be happy enough. *Final Copy*'s output is excellent, however and it can print in up to 4096 colours. So check it out. And read Mark Smiddy's review in *Amiga Shopper* issue 15 if you can.

Although it's getting a little long in the tooth, the LC200 has been a workhorse for many people, though its 9-pin output looks a tad crude nowadays.

A better bet would be to plump for the more expensive LC24-200 (the 24-pin version) or alternatively check out the Citizen 224, which will only add around £40 to the cost of an LC200, but vastly improve your printed output.

Don't worry about video connections to and from the computer, video and digitiser. If you buy an RGB monitor and a SCART switcher (about £20) you can happily swap between video and computer outputs at the flick of a switch. However, if your video only has SCART output you'll have to get another lead for when you want to connect it to the VIDI 12. I think this will probably be a SCART to Phono, and you should be able to get one at Tandy's. You might also want to consider buying a parallel port sharer, as both the printer and the digitiser use the Amiga's parallel port, though a quick reconnection from time to time won't do any harm.

Try Hobbyte, in Luton Arndale Centre, or WTS Electronics in Chaul End Lane and see if they can put everything together for you. At least they'll be local if you have a problem.

Finally, I don't do shopping lists, but a quick glance through *Amiga Shopper* says that the whole lot (Amiga, HD, memory, monitor, printer software and Vidi 12) will cost a little more than your £1000 budget, though this is from several different dealers.

You may be able to negotiate a better price if you get it all from just the one dealer. ***GW***

JARGON BUSTING • JARGON BUSTING

Font – the group of letters, numbers and special characters that comprise one variation of typeface, eg: 12pt Times, 12pt Times Bold, 12pt Times Italic. Sometimes (mistakenly) used in desktop publishing to refer to a type family.

Include files – supplied by Commodore, provide all the offsets needed to access system library routines, and the formats for all system structures.

Intuition – the part of the Amiga's operating system concerned with window handling, menus and so forth. It interprets user input from the mouse and sends information to the relevant windows via the Intuition Direct Communication Message Ports.

Jaggies – the jagged edges seen on diagonal lines, caused by the use of small, but nonetheless finite, rectangular pixels to make up a picture.

Library – the Amiga has many special features, and programs are already present in the operating system to make use of these features. These programs, or library functions, may (and should) be used by applications programs, obviating the need for each programmer to write a similar set of routines.

ROM sharer – a device which will hold more than one ROM (the chip in which Kickstart is stored) and enable the user to choose which version to use.

FILE NOT FOUND

I have just bought October's *Amiga Format* with *DevPac 2* on the cover disk. After completing the tutorial in the magazine, I tried to assemble other source code from various other magazines. When I clicked on Assemble, it reported "file not found" on where there were lines using "include" as a command. I have looked for these files but I cannot find them anywhere. Could you please tell me where they are or how I can get hold of them? Are they in the original packages?

Justin Hannan
Chester-le-Street
Co. Durham.

There are two reasons why this could be happening. Firstly, the source files in question are using custom include files especially for that program. In which case, it will be hard to find them. Hopefully, it will simply be "The Case of the Missing Commodore Include Files.". These files, with names like "exec/exec.i", "intuition/screens.i" and so forth are included in the original packages. They can also be bought separately from Commodore. If you wish to buy them, along with lots of other handy development tools you need to write to:

Developer Support,
Commodore Business Machines,
The Switchback,
Gardner Road,
Maidenhead,
Berks SL6 7XA

and ask for information on the current "Native Developers Toolkit." This will probably cost around £25 and is worth its weight in gold. ***TS***

CLOCK THAT!

When booting up I get the message "Can't find battery backed-up clock". My clock works if I reset it each time — what's going on?

RA Thorne
Henley

When you say reset do you mean RESET or re-set as in change the time? The most likely cause of this is the hardware clock has been corrupted at some point and you are only re-setting the system software clock. The RTC on the trapdoor is only read during boot-up, after that the system time is maintained by Kickstart using timing "ticks" from one of the CIAs. The simple answer is to leave the machine on for at least eight hours to make sure the battery is fully charged, the follow these steps:

a) Boot your Workbench disk.
b) Open a Shell window.
c) Enter the following:

```
SETCLOCK RESET
```

d) Now set the clock from Preferences and select SAVE. Nip back to the Shell and check the time and date are correct like this:

```
DATE
```

e) Just to make sure the RTC is fixed, now enter this:

```
SETCLOCK LOAD
DATE
```

and you should get the same date and time back again.
f) If that doesn't work, follow Steps c and d again but skip step e. Now enter:

```
SETCLOCK SAVE
SETCLOCK LOAD
DATE
```

If the clock is still causing problems, get the RAM card checked out by your local dealer. **MS**

LONELY AS A DESKJET



I am thinking of getting a Hewlett-Packard DeskJet 500 and *Wordworth.* Does *Wordworth* support the DeskJet 500?

**Mark Buckle
Bath, Avon**

Currently *Wordworth (1.1 Rev 6)* supports the DeskJet 500 better than any other Amiga word processor.

Text and pictures will print without problem provided you have enough memory to do the job.

The fact that the text and pictures are all loaded into the word processor – that is, formatted and ready to print – does not mean you have enough memory.

The word processor will require more memory to print your document, especially if you are using Amiga screen fonts as opposed to the fonts built into the printer.

Wordworth is able to use these printer fonts, but if you want graphics and printer fonts on the same page you'll have to pass the paper through the printer twice – first to print the text, then the graphics.

How much memory you actually need will depend on how many pictures are loaded and the size of those pictures, how many Amiga screen fonts are loaded and the size of those fonts, and the output quality selected at print time.

Is 1Mb enough? For one page of text with one picture on it, yes. Two pages? Depends what's on them.

Wordworth, the DeskJet 500 and at least 3Mb of memory is a good combination, but, as always with this kind of word processing (which is semi-DTP really), the more memory the better. ***JW***

DOUBLE TROUBLE



I started using Amiga computers to add titles to our videos about two years ago, and later bought an A500 with 0.5Mb RAM expansion and *Pro Video Plus:* for what it cost this was a very good buy, although the quality was not that good, in terms of 'jaggies'.

This year I acquired an Amiga 2000, with *WB2.04,* with a view to running titling programmes, in the hope that it would be better. With this in mind, I had the supplier, Hobbyte, install an extra 2Mb of RAM.

My first attempts at titling with the new machine were with *Broadcast Titler 2,* which unfortunately did not produce satisfactory results. Font selections were poor, definition was bad, and anti-aliasing was essential, but the result was still below our older program. *BT2* was returned.

***Pro Video Post* (a development of *Pro Video Plus*) won't function properly with our Amiga 2000. For example, end titles would normally roll, but with *PV Post* a single pixel black line appears at the page break when using vertical transitions. It won't work at all on our A500. Shereff Systems, who produce *PV Post,* haven't responded to my letters.**

Another important use of our Amigas is for Edit List Management, for which we use MicroIllusion's *EDLP* system. In this case the problem is that it will work on occasion with our A500, but often crashes five or six times on boot, sometimes freezing up the machine. EDLP works OK with the 2000, but certain functions don't work correctly under *2.04.*

We retail our videos to the public, so the quality of titling is important (we use professional BVU-SP machines for editing). The quality we get from the Amiga is very disappointing and so are the results we've had from our extra investments over the last year. Could you make any suggestions about:
•more effective titling software?
•how to improve the reliability of our WB 1.3 Amiga 500?
•whether there are updated versions of the programs mentioned which will work on our Amiga 2000?
•whether fitting a ROM sharer to the 2000 might help to run programs which work badly on the A500?

At present I am very disappointed with these Amiga-based systems. I'd like to use the machines for other things, particularly 24-bit graphics, DTP etc, but my experiences so far make me think that Amigas are, after all, best regarded as games machines and it would be better to look at something more professional in the PC or Mac field, despite the extra cost.

**Andrew Saunders
Great Dawkins
Essex.**

I'm sorry to hear you've been having so much trouble. One thing which struck me immediately was that you haven't mentioned what you use for encoding the Amiga's RGB output into video. Since you are using BVU SP for recording, I hope that you are using a suitable quality genlock or RGB encoder, not one of the cheaper, domestic-type units! This might go a long way to explaining some of the problems you are having. If you *are* using a good one, have it checked over for faults and alignment.

I have used Amigas with *Pro Video Plus, Pro Video Post* and *Broadcast Titler 2* for video work, including broadcast and, of the three, I would always recommend **BT2** out of choice. I can't understand your comments about jaggies with *BT2* - unless you are being hyper-critical.

While I have sympathy with your situation there are many happy users of Amigas which are fitted with 24-bit cards (and this includes national broadcasting companies) and plenty of professional DTP'ers who use Amigas to produce high-quality work, including colour postscript output. It seems that there is something fundamentally flawed with your Amiga video setup which has led to your despairing conclusions.

I'm pretty sure that the problems with *Pro Video Post* are being caused by it being incompatible with WB2 (in the case of the Amiga 2000) and that the 0.5MB of CHIP (display) RAM on your A500 is not sufficient for it to run at all. A ROM sharer in the A2000 *might* solve this one, but you'll have to upgrade your A500 to 1MB of CHIP RAM to stand any chance of success with *PV Post.* I think you'll find that such problems are mentioned in the manual you got with the software and that some of the earlier Amigas are no longer suitable for newer, more powerful, software which is designed to run on correspondingly more powerful machines. I'd suspect that such incompatibility problems are also the root of your troubles with EDLP. It always pays to scrutinise the recommendations of the software publisher before you buy - if only to discover whether the software *is* actually suitable for your system.

The only other advice I have to offer is to have another look at BT2 - it IS a top-notch program - and try another genlock/encoder if things still look bad. You seem to be having an uncommonly difficult time, and I have to say that for all the love/hate relationships there are with both Commodore and their Amigas, they are nowhere near as depressing as your unfortunate experiences would indicate. ***GW***

INACTION REPLAY



a).I wish to buy an accelerator for my A1500 that does not make the Action Replay cartridge redundant, ie. that either does not use the 86-pin expansion slot or has a pass-through port. Is there such a card or a method of using both simultaneously?
b) I wish to purchase the Magneto-Optical drive from Power Computing and wonder if (how) I could use the Dataflyer SCSI board (with 52Mb hard disk) with the Magneto-Optical drive or would I have to purchase a second SCSI board?

**Anthony Steel
Swansea
W Glamorgan**

Unfortunately the Action Replay cartridge (on the Amiga 500 at least) doesn't work with an accelerator fitted anyway, so the problem that both the accelerator and the Action Replay require the same slot is rather beside the point. The way the Action Replay cartridge (and similar cartridges) work makes it rather unlikely that any will work properly with an accelerator fitted.

And it's bad news on the SCSI front too, you will need a new SCSI card for the Magneto-Optical drive, preferably the Commodore A2091 or GVP Impact II. Once you have that, put your 52Mb Quantum on the new card too and ditch the Dataflyer. ***JR***

I WANT TO PROGRAM



I am keen to start programming and have some good ideas for projects. Now I know this will take time but is it worth it with all the stupid changes that Commodore are making - by the time I get on my 'computing feet' the A500 be dead and I will have wasted my time so my first question is 'is it worth it'?

If it is, could you advise me on what packages to start with? I was considering *Amos* followed by *Devpac III* but will learning *Amos* have been of any help to me once I come to *Devpac* or will I have to start again?

**A User
Gower
Swansea**

The bad news is that computers will continue to change and you are quite right – the A500 will probably be dead and gone long before you've got to the point where you can write professional programs. If, on the other hand, you think you really can knock out a commercial product in the relatively near future then sticking to the standard Amiga

JARGON BUSTING • JARGON BUSTING

AmigaDOS – the most basic part of the Amiga's operating system – the collection of programs that take care of the general running of the machine. AmigaDOS concerns itself with device-handling: control of the keyboard, basic screen output, disk drives, printers and so on.

ANSI C – a standard for the language devised by the American National Standards Institute, which differs from some areas and clarifies others of the original definition of C given by Kernighan and Ritchie, the language's creators.

Basic – Beginners' All-purpose Symbolic Instruction Code is a high-level programming language, much favoured by micro-computer users. It combines a fair amount of power with ease-of-use.

ECS – Extended Chip Set is the name given to the new versions of the Amiga's custom chips which handle graphics and sound.

Editor – an editor, like a word processor, is a means of entering text into the computer. Programs are written with an editor before being turned over to a compiler or interpreter.

Multisync monitor – a monitor which can accept its signal at a variety of frequencies, usually ranging from 15 to 32 KHz. A multisync is useful for displaying signal produced by a flicker fixer or from an IBM PC VGA card.

programming conventions will safeguard you against most aspects of current model obsolescence.

Only you know how much enthusiasm for learning you've got but there's no doubt that a certain amount of what you learn will seem to be wasted as time goes on. For instance, ten years ago I was doing a lot of 6502 and Z80 assembler programming but now most machines based on those processors are buried in peoples gardens (or should be). What you will need to do is isolate yourself from as many programming 'danger areas' as possible by concentrating on programming techniques, rather than machine-specific hacks and tricks. That way the things you'll learn will remain useful long after the current Amiga range has bitten the dust.

As far as languages are concerned there's nothing wrong in starting with *Basic* and *Amos* is an excellent Basic-type language. Devpac III is great but tackling assembler on the Amiga is not something I'd recommend you do in your early programming days. ***PAO***

WHICH AMIGA?



For Christmas this year I am hoping to get an Amiga 500 Plus. I have seen adverts for A600's, and I fear that I may not be able to get one. I think I will get an A500 and will then expand it to 1MB. Would this cost a lot? Also, could I run my ever expanding collection of magazine disks and games on my expanded A500? Who would do the expansion, could I do it myself or would I have to get a dealer to do it? I definitely only want a 1MB machine. As a last resort, if I got an A600, could I still run all of my A500+ stuff on it? Please answer truthfully as I really need the help and advice.

John Bolton,
Stourport-on-Severn
Worcestershire

1MB expansions are currently very cheap and easy to fit. If you are worried about the fitting yourself, then you could get a dealer to do it for you. It is unlikely that they would charge you for such a simple operation. 1MB expansions can cost as little as £25 now, or around £30 for one with a real time clock.

As far as software compatibility goes, this rather depends on how well the software was written. Anything that runs on the A500+ will run on the A600 with no problems, as they are essentially the same machine but in different boxes. Its the older A500 software that could possibly cause problems for you. Some of this software was badly written, and is incompatible with Commodores new operating system: *2.04*. ***TS***

MORE OR LESS?



The description of MORE in "Using the Amiga Workbench - the Official Guide" states that SHIFT-E allows editing of the file using the editor defined in ENV:Editor. The description of environmental variables says: "SET - Creates a local environmental variable." "SETENV - Creates a local environmental variable."

Mastering AmigaDOS 2, V2 gives two examples for setting MORE's editor, viz.:

```
a) SETENV EDITOR C:ED
b) ECHO >ENV:EDITOR "C:ED"
```

The first example does not work at all, the second attempts to invoke ED but fails with the error required argument missing. Can you explain how to invoke MORE's editor successfully?

Also, "Using the Amiga Workbench" mentions only Analog and Digital. Mastering AmigaDOS 2, V2 mentions Analog, Digital1 and Digital2.

Can you clarify this please?

G Roberts
Moor Row
Cumbria

Since I was the author of one of the texts mentioned there I will attempt to put matters straight.

The first example given in Mastering Amiga's*DOS 2, V2* does work as described. I cannot get it to fail at all. The second example described there is intended as an example (as it states in the text you should always use the command). It should have read:

```
ECHO >ENV:EDITOR "C:ED"
NOLINE
```

To explain. When you press SHIFT-E, MORE reads the contents of the variable in ENV:EDITOR and adds the name of the file it is currently viewing. It then sends this as a command line argument to AmigaDOS. The second example does not work because ECHO appends a line feed to the variable which the command parser reads as end of line. Put another way, it looks like two separate lines. If MORE was showing S:SPAT, and you called the editor it would send AmigaDOS:

```
C:ED
S:SPAT
```

The clock problem is something of a nusiance. Somewhere around the release of V36/37 (I no longer have an old enough version to check) CLOCK was re-written and the two DIGITAL modes were replaced by a single one, ergo.

```
run clock digital
```

You can still append the X and Y co-ordinates if you wish:

```
run clock digital 200 0
```

This error was entirely mine and should have been corrected in the new edition. However, in all cases like this — if in doubt ask *AmigaDOS* what the current version is:

```
VERSION <command> FULL
```

and

```
<command> ?
```

to get the latest template. ***MS***

CONFUSED OF HIGH WYCOMBE



I am considering buying an *AVideo 24* card and I would like to know a little more about it, namely:

•Is there any proper English documentation for it yet?

•Does the documentation go into enough detail to allow me to write programs for it in *HiSpeed Pascal*, for instance?

•As normal Amiga graphics can be overlaid, how does it cope with the Super Hires mode when its resolution is only 768 x 580?

•Does it require a multisync monitor?

Finally, with all the rumours of the new AA chip set, do you know whether it will be a direct replacement for the existing ECS, or will we all have to go out and buy a new computer?

Darran Williams
High Wycombe
Bucks.

The basic documentation for *AVideo* is available in English, though it isn't amazingly detailed. There are Developer Docs included on the disk, which I'm told are adequate (though again not brilliant), but you should at least be able to figure out the Libraries and so on.

I'm not a programmer, so I have no idea whether you could use *Pascal* to communicate with *AVideo* – though *ARexx* can be used, if this provides any clues for you.

AVideo 24 doesn't support Super Hires mode at all, and you don't need a multisync to use it - in fact it is much preferable without.

By the way, remember that *TV Paint* (as available for *AVideo24)* needs a 68030 processor installed in the Amiga before it can be used, and that you need a fair amount of RAM (>4MB) to make best use of it!

On your other questions, the new AA (or AGA as they are officially known) chip set is *not* a direct replacement for the ECS so, yes, it will mean having to buy a completely new Amiga if you want the new graphics modes. ***GW***

GOT IT TAPED



I have a Wangtec Tapestreamer. How do I connect the tape streamers to my Wordsync 2000, ie (a) what lead (for internal fitting)? (b)

How do I configure it with SCSI numbers, etc? What software is required to run it? What are SCSI and LUN numbers?

Nigel Barker
Weston-Super-Mare
Avon

All you need is a three-way SCSI lead to connect your devices together, a

reputable dealer will be able to make up a lead for you for around £12. Every device connected to a SCSI controller needs a different SCSI ID number (between 0 and 6).

Most hard disks are set to either 0 or 6 by default, so choose 4 or 5 on your tapestreamer and you should be OK. Usually there are three jumpers on SCSI devices labelled 0 1 and 2.

These make up binary digits of a number 0 to 7. Use the following table to work out what jumpers need to be set for the ID you require:

```
ID 0    No Jumpers set
ID 1    Only set Jumper 0
ID 2    Only set Jumper 1
ID 3    Set jumpers 0 and 1
ID 4    Only set Jumper 2
ID 5    Set jumpers 0 and 2
ID 6    Set jumpers 1 and 2
ID 7    Set all jumpers
```

(not usually allowed on SCSI devices)

Some devices contain more than one Unit (LUN) number, a good example is the Pioneer CD-ROM drive that contains six CDs in one box. Each CD has a different LUN number. For most SCSI devices (including all hard drives and tape streamers) LUN 0 is all that will be recognised and all that you have to worry about.

The software to run the tapestreamer comes with your Amiga on the *Workbench* disk. It is called HDBackup, and will support SCSI tape drives.

Alter the S:BruTab file to set up HDBackup for your Tapestreamer. Alter the entry for TAPE:, change SCSI.DEVICE to SUPRADIRECT.DEVICE and the unit number to the number that you set your Tape unit as. Do the same for the NTAPE: entry.

Although HDBackup will work there are other programs that will support your Tapestreamer directly. *MrBackup Professional* and *Quarterback 5.0* both support tape devices, but my favourite is *Ami Back V2.0* which is very powerful, yet easy to use. ***JR***

MORE THAN C

I would like to start learning *C* or *C++* (progressing on from *Basic*) and would like to know the difference. What commercial packages are available and how much do they cost? Also I have noticed that my computer gets very hot when used for hours on end. Will the power supply burn out with this sort of prolonged use?

Andrew Cheung
Wallington
Surrey

C++ is an object-orientated language which is a sort of high-power extended *C*. Some of the new ANSI C characteristics incidentally, such as the use of function prototypes, have come from *C++*. Both languages are available on the Amiga although it must be said that *C++* has not really acquired the following that some *C* gurus originally expected. You can expect to pay about a couple of hundred pounds for the *C compiler* and somewhat more than that for *C++*. The best commercial *C* package is *Lattice/SAS* and it is also *Lattice* who support a *C++ compiler* (which needs at least 1.5Mb to run).

Power supplies do get hot and some Amiga power supplies, like all other computer power supplies, do overheat and burn out. Most however, despite the fact that they seem to get rather hot, do not. I regularly have my Amigas running for 24-36 hours at a time and I've only had one power supply go in the last seven years! ***PAO***

MONITORS AND MORE

I own an Amiga 500 with 2MB, *Kickstart 2.04* and a 20MB Novia internal hard drive and I am looking for help with the following problems:

a) I am looking for a Multi-sync monitor to display all standard screen modes, without the need for a flicker fixer, it must be under 300 pounds if possible.

b) What is the difference between an SVGA and Multi-Sync monitor, and does a Flicker Free video board work with both?

c) I am looking for a COBOL compiler for the Amiga, without much luck. Do you know of any?

d) I am looking for a Hard Drive menu system, preferably one where the user just has to press a key to run the required program, eg, 1 Word Processor, 2 Pascal etc.

e) I am also after a quicker Startup-Sequence for the hard-drive as the one I just just now is fairly slow, I just copied the one from the WorkBench disk to the HD.

f) Can you tell me which printer driver to use for a Digital LQP45 daisywheel printer, with a serial interface?

Robin Brown
Smithton
Inverness

a) I am afraid that you will need a flicker fixer for sure in order to get all modes without flicker. The Amiga can only output its video information at one speed. The monitors capable of displaying the higher resolution modes, such as VGA, without flicker do so by receiving information at different rates. A Flicker Fixer generates these special clock rates that the Multi-Sync monitor will understand.

b) SVGA and VGA monitors are generally a bad buy for Amiga owners. You can ONLY use them with the flicker fixer ON, and some will have problems with some Amiga modes. They are designed specifically to display the PC's 320 x 200 and 640 x 480 VGA modes. The SVGA monitors are simply higher spec to be able to show the higher resolution SVGA modes. If you are unsure, its best to check with a dealer but you WILL need a flicker fixer. We use a VGA only monitor here in the office on an A2000 with no problems, but the flicker fixer must remain on. The term Multi-Sync means that the monitor is A) More expensive and B) able to automatically detect what speed the information coming into it is, and switch over to it. This is by far the best option for Amiga owners.

c) Goodness, it must be COBOL's lucky day! Thats two queries about this strange language in one month. I'm afraid I don't know of a COBOL compiler for the Amiga.

d) There are a number of Menu programs of this sort for the Amiga in the PD. I would personally recommend using a program like ToolManager 2.0, which is an excellent PD program that allows you to add Programs to the Workbench's "Tools" menu.

In addition to this, ToolManager has a "Dock" feature which allows you to join lots of little Icons together in a strip, and clicking on one will run that program. Its like a visual menu that is permanently on view on your Workbench screen. In addition to this, ToolManager will allow you to use keyboard short-cuts to run particular programs. For example, left amiga and D to run DPaint.

e) Its best to agree to disagree with the startup-sequence. I would not recommend summarising it if you can bear the length of time it takes to run. Most of it is quite important. An in depth discussion on what you can and can't remove is beyond the scope of this answer, but you can get further information from the "AmigaDOS Manual, 3rd Edition.". The WorkBench 2 startup sequence is pretty much as small as it can go as it is. You could, however, remove any references to MOUNT AUX: MOUNT PIPE: and MOUNT SPEAK: if you wish to. Likewise, the ECHO command's can go and so can ASSIGN REXX: if you are not using ARexx.

f) As a general rule, to try getting a printer to work that you do not have a driver for, try EpsonX first. I am afraid that I could not find a driver for the printer you mentioned. If you cannot get it to print, try copying files to SER: after setting up the serial preferences to match the printer correctly. For example:

```
copy s:startup-sequence ser:
```

This should print this file out. ***TS***

THIS WOMAN'S WORK

The majority of your questions come from men, how about coming to the aid of a 'woman driver'? I have two irritating problems with *PageStream 2.2*. First, despite its much acclaimed and publicised irregular text runaround facility, I still can't get the program to do it.

It works perfectly well when I use the structured drawing tools – the text flows neatly around a square, rectangle, triangle, circle or ellipse – but when I draw a freehand shape the text resolutely flows around the box and not the object within. Obviously I'm doing something drastically wrong somewhere, but what?

Secondly, I use single sheet feed and A4 paper. Why, when printing at the bottom of the page, will the printer advance the paper but not fully eject it? In order to clear the buffer I have to insert a fresh sheet of paper, press the on-line switch, allow the paper to continue advancing, turn the printer off line, eject that page using the paper feed switch, then re-insert a fresh sheet. Then, and only then, can I print my next page.

If you are able to print a reply please could it be in words of one syllable? Big words bother me.

Gill Noyes
Borough Green
Kent

The answer to your first problem is that irregular runaround doesn't work with the Freehand drawing tool. Use the Polygon tool instead. (Don't blame me, it's not my fault). The paper feed problem is more tricky to sort out because exactly the same thing has been happening to me for ages. I've never mentioned it or bothered to investigate because nobody has ever brought up the subject before.

Um. Check that the Paper Size dimensions in the Global/Configure Printer requester are set correctly. For A4 they should be 21cm and 29.7cm. But as you are using single sheets, and as your printer probably requires the bottom half inch (ish) for itself in order to feed the paper out, it could be that PageStream is 'printing' this bottom part of the on-screen page on a new sheet (because it couldn't print it on the first sheet because the printer stole the bottom half inch). Try knocking the actual on-screen page size down to 28 or 28.5cm. Worked for me.

May I just say that the reason most of my questions come from men is because women have more organised brains and are better DTPers. ***JW***

DRIVING ME MAD

I realise this is something of the fabled "piece of string" question, but how reliable should 3.5" floppy disks be? Having been subjected to one too many read/write errors with my Roctec external drive I invested in the Power Computing dual external. Whist this has proved a fine and reliable piece of hardware, I still seem to suffer from occasional disk corruptions. At a guess I would say every three to four weeks of heavy evening use brings a disk corruption and this seems unacceptably high.

I use the best branded disks I can find and clean the drives often. I check for viruses regularly and all appears well. The only aspect of the system that worries me is the four way adapter powering the system due to the layout of the room. Do you have any suggestions or am I just expecting too much?

I intend to upgrade my Amiga to *Kickstart 2* in the near future. How worthwhile would it be for me to install the rest of the ECS? The main applications I run are *Pen Pal, Sequencer One Plus* and *Lattice C.*

John Kinley
Palmers Green
London

A systems analyst friend of mine claims his experience of 3.5" media has been less than good and is happier with the older 5.25" media. The reason for this is probably the required density of the magnetic particles is lower on the larger media, and with care this might make it more reliable. Also, 5.25" media is usually specified for lower density devices: on the PC 1.2M for 5.25M HD devices compares with 1.4M for 3.5". Nevertheless, I have also heard tails of people running cars over disks, doing origami with them and even washing them — and they still work afterwards.

You can read from that, portable magnetic media is more robust and reliable than you might think — certainly more so than your experience suggests. Disk drive heads are precision manufactured components (if they were made as one-offs the costs would be astronomical) and this could the problem. The answer to your question is, most probably, one of overdoing it. Head cleaners are only useful when the head is dirty — typically after several YEARS of constant use. If you use them too often two things happen:
{blob} Small particles of magnetic material get lodged in the fibres and after a few more revolutions dislodge back onto another part of the drive head. When you insert a disk, the particles act like an abrasive and scratch the disks — causing wear, and therefore, read/write errors.

JARGON BUSTING • JARGON BUSTING

Flicker fixer – a card that plugs into the A2000's video slot and removes the flicker from the Amiga's interlace mode and the visible scan lines in the non-interlace mode. Interlace mode is the Amiga's way of doubling the vertical screen resolution, but normally by effectively halving the screen update rate and creating flicker.

Icon – a graphical representation of a program, piece of data or device such as a disk drive. Clicking on an icon will open its corresponding file.

Interlace – a method used to double the apparent vertical resolution of the monitor by alternately refreshing the screen at a slight vertical offset, thus squeezing an extra line between each of the lines of a non-interlaced screen.

Multisync monitor – a monitor which can accept its signal at a variety of frequencies, usually ranging from 15 to 32 KHz. A multisync is useful for displaying signal produced by a flicker fixer or from an IBM PC VGA card.

Startup-sequence – a program which is executed every time the Amiga is switched on and after every reset. It sets up the system so that it is usable from Workbench, and may be customised by those who have unusual hard or software requirements.

•After constant use, the abrasive dry cleaners will wear out the drive heads or clog them up. In any event, the whole mechanism will have to be replaced.

If you open up an old disk, you will notice it is sandwiched in something like tissue paper. This is not there by accident — it's there to pick up the excess particles of magnetic material. In other words, disks are self-cleaning! Consider this: like most old-timers, I treat head cleaners with the contempt they deserve, never use them and rarely get problems — even with cheap, unbranded disks. ***MS***

TURBOPRINT NOT NEEDED

Is it possible to get *PageStream 2.2* and *Turboprint* to work together? PageStream insists on using its own printer drivers and will not accept any others. If I try to redirect the output to PRT: instead of PAR: I just get garbage.

It seems to me that *Workbench, Turboprint* and *PageStream* drivers are incompatible with each other. If so, what can I do? I get banding and dark graphics with with *PageStream,* both of which I know can be fixed with *TurboPrint.*

Adrian M Layden
Stoke-on-Trent

To force *PageStream* to use the printer driver you have selected from *Workbench* Preferences, Load and Save Default (from Global/Configure Printer in *PageStream)* the *PageStream* printer driver called Preferences.

Alas, this won't help the *TurboPrint* problem. *PageStream* insists on using its own dither patterns when printing, no matter what options you have selected from *Workbench* Preferences or from within *Turboprint. PageStream* does this because it needs to be sure what pattern is being used so that it is able to change the Screen Frequency and Screen Angle, if asked to do so.

Screen Frequency is a 'lines per inch' figure and in effect it informs *PageStream* what size the cell for the dither pattern should be. Your printer (a 360 by 360 dpi Star LC24-200) can only really represent 16 shades of grey (including solid black and solid white), so you only need a cell size that contains 16 pixels, or a 4 by 4 matrix in other words. To work out the correct Screen Frequency figure for 16 shades of grey, divide the cell width (4) into the printer resolution (360), which give a figure of 90 lines per inch. Click on each of your PageStream graphics (bitmapped and/or structured) and enter 90 into the Screen Frequency gadget in the Edit Coordinates requester for each graphic, and you'll find that your graphics will print much brighter.

This feature of *PageStream* is a similar technique to that which *Turboprint* employs to improve the output of graphics.

(DeskJet and LaserJet users have a maximum resolution of 300 dpi, so their Screen Frequency figure for 16 shades of grey is 300/4 = 75 lines per inch. A Screen Frequency of 100, which is 300/3 and therefore a 3 by 3 dither pattern cell, would give a maximum of 10 printable shades of grey including solid black and solid white.)

The Screen Angle is simply the angle at which the dots are arranged in the dither. A good ballpark figure is 45 degrees, but you can experiment with this for each and every graphic. ***JW***

HAPPY SHOPPER

a) I have my own black and white photographic darkroom and I want to use DigiView to record my contact sheets and use the pictures as the basis for design work at college. I've made a template in DigiPaint 3 for laying out the grabs, and set the blank spaces to be the same size as a DigiView quarter screen scan. So far so good. The problems arise when I try to expand the grab for closer inspection. If I pick up a grabbed image as a brush and scale it up the quality deteriorates in ratio with the enlargement. I have tried grabbing at the highest size and resolution and then shrinking the result, but the image always becomes unacceptable after scaling up again. Is there a way round this?
b) I use *Wordworth 1.1* for my word processing requirements, saving the files in ASCII onto a PC-formatted disk using *MessySID.* I load the files into an Apple Mac at college and then print them out with a laser printer as the quality is much better than that of the Star LC24-200 colour printer I use at home. I have recently read that *Wordworth* can use Compugraphic fonts (like PageSetter II) when running under *WB2.04.* Is there any way I can do this with *WB1.3* so that I can have better quality prints without the fuss?
c) I may consider upgrading to *WB2* if I can rob a bank or something. I'm worried that when I do upgrade that the information on my hard disk might be affected, as it has taken me the best part of a year to configure everything how I want it and I would hate to have to do it all again.
d) I'm considering trying my hand at *ARexx* programming. Do you think this would be too advanced for a complete beginner? I would like to be able to write scripts to control *DigiView Gold,* as suggested in the manual provided. What do I need to get started, etc?

Steve Hughes
Farlington
Hants.

a) As you have discovered, whenever you blow up a bitmapped graphic, such as your digitised images, they very quickly start to turn nasty on you. What happens is that the small images which you are expanding only contain enough information to describe that image. Since the picture is made up of separate dots (pixels) of different colours you just get bigger versions of them when you enlarge the image, which is why your pictures start looking naff. There are software image enhancers which can improve things a bit by trying to work out what might be there, based on surrounding data, but they're not

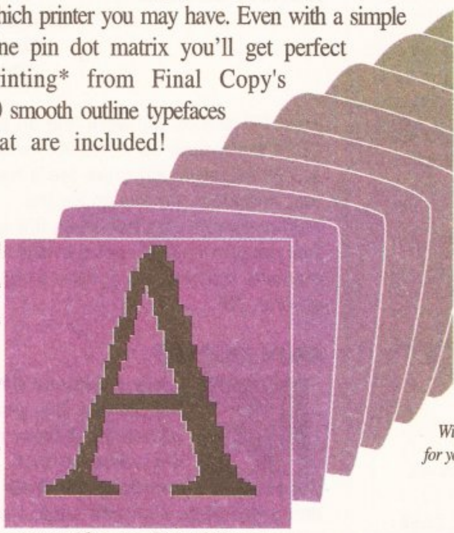
Due for release during September 1992

THE FINAL WORD

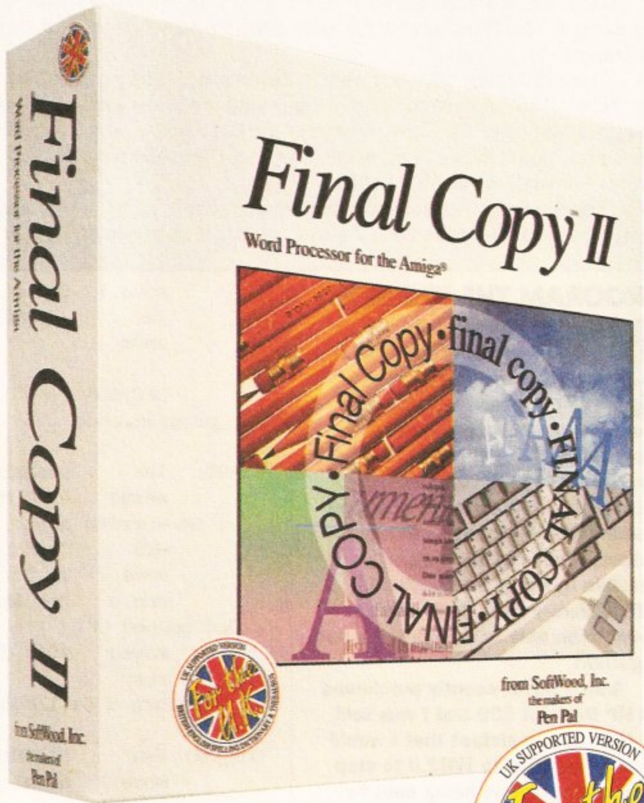
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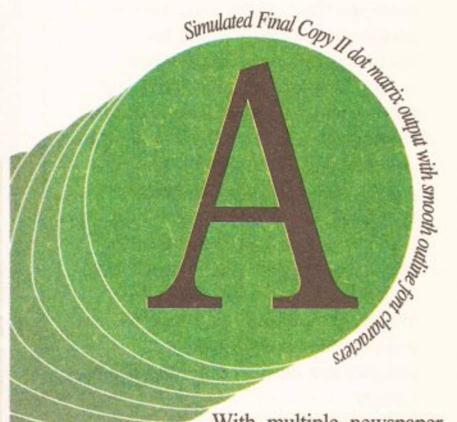
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AMS

continued from page 32

likely to help you much.

Like most things there is a simple solution. Instead of digitising at quarter screen size, do it at the highest, and largest resolution that your set up will allow - in black and white if your photos are monochrome. Shrink these images down to put in your template for quick reference, but don't discard them, as they will be your master images which you will use for manipulation. Label each small image for reference with the same name which you have filed it under. Then, when you want to work on it, load the original image up and off you go. You can make things easier by loading your large images into *DigiView 3* and then saving them again, unchanged. *DigiView* will add an icon to them in the form of a miniature version of your original, so you can see at a glance what pictures are on disk and load them quickly.

b) No, the special form of Compugraphic fonts (known as Outline fonts) used under *WB2.04* are not compatible with *WB1.3* applications. It's easy to get confused about this scalable font business, as Jeff Walker would no doubt point out if he was writing this, since there are several different formats currently in use on the Amiga. *PageSetter II* (in common with *Professional Page 3)* uses AGFA Compugraphic fonts. *PageStream* uses a variation of these which are incompatible with other programs, while the Amiga Outline fonts (which are yet another variation of the AGFA format) are also pretty much an entity in themselves. However, the *WB2* program Fountain can convert a standard AGFA Compugraphic font into an Amiga Outline font. Lastly, a competitor of *Wordworth, Final Copy,* comes with its own scalable fonts which aren't compatible with any of the above.

c) I'd recommend changing to *WB2,* it's worth the effort. Before you start, back up the contents of your hard drive using a recognised utility such as *QuarterBack* or *AmiBack,* just in case anything goes wrong. Then, once the *WB1.3* system has been replaced with *WB2.04,* and you make a few more adjustments to get it the way you want, you'll very quickly reap the benefits - including using Outline fonts with *Wordworth.* d) If you want to use *ARexx,* you may as well get *WB2,* as *ARexx* comes free with it. Mind you, the documentation supplied by Commodore is dreadful. As mentioned elsewhere, get Abacus' "Using ARexx On The Amiga" book (£26.99 from Trilogic, for example). And read the tutorials printed in Amiga Shopper. It's not too hard to get to grips with – even I can use it, at least enough for the things I want to do! ***GW***

SLIP OF THE BRAIN



I have a Canon BJ-10ex printer and I am using the EpsonX[CBM-MPS-1250] and BJ10 printer drivers with it. With Business Card Maker the right-hand image 'slips', and using *Notepad* and *Graphics* a spade symbol is printed by the MPS-1250 driver. With Interword the characters "XFO" appear on every printout, regardless of printer driver. Dataeasy and Ilinios are perfect.

Graeme M Ross
Ayrshire

The BJ-10ex emulates a 24-pin Epson, so in that mode you should be using EpsonQ or Nec-Pinwriter, not EpsonX[CBM-MPS-1250] which is a 9-pin printer driver.

The BJ10 driver does not work in Epson mode. You need to alter the dip switches. The documentation that came with the driver will advise you what to do. If you need the latest version of the BJ10 driver, which includes the full instructions plus a Preferences and Font Download program, you can get them from JAM on 0895 274449.

Keep in mind that some of the programs you're using are PD and may not work well. Business Card Maker in particular is extremely suspect. ***JW***

PROGRAM THE PRINTER



Please could you demonstrate with a small piece of assembly language programming how to send text to the printer (Using the PAR: device not the PRT:, although I imagine this would be a matter of changing a string holding the direction of the output). I believe the task is possible by using the OPEN and WRITE library calls, but I don't seem to be able to combine the two together!

Also, I have recently purchased an HP DeskJet 500 and I was told by the sales assistant that I would have to upgrade to *WB2.0* to stop random characters being sent to the printer, bearing in mind that I've sent away for the JAM driver for the printer, is this really the case, or were they trying to get £80 out of me?

Richard Paul,
Andover,
Hampshire

Try this small program. Depending on the include files that you have, you may need to change the "include" lines:

```
        incdir  "inc:"
    ; Point this to your include files.
        include "dos/dos.i"
        include "dos/dos_lib.i"
        include "exec/exec.i"
        include "exec/funcdef.i"        ; You may or may not need this line!
        include "exec/exec_lib.i"

DOS:            macro
        move.l  DosBase,a6
        jsr     _LVO\1(a6)
        endm

SYS:            macro
        move.l  $04,a6
        jsr     _LVO\1(a6)
        endm

        SECTION our_program,code

START:  lea     DosName,a1
        moveq   #$00,d0
    ; No worries about version
        SYS     OpenLibrary
        move.l  d0,DosBase
        bne.s   Dos_Ok
; Dos opened OK.
        moveq   #$0a,d0
        rts
    ; Return a fail code.

Dos_Ok: lea     FileName,a0
        move.l  a0,d1
        move.l  #MODE_NEWFILE,d2
        DOS     Open
        move.l  d0,Channel
        beq     FileFail
; Couldn't open output file.

        lea     TextToSend,a0
        move.l  a0,d2
        move.l  #TextEnd-TextToSend,d3
        move.l  d0,d1
    ; Recover Channel
        DOS     Write
    ; Print the string.
        move.l  Channel,d1
        DOS     Close
    ; Close the output file.

FileFail:       move.l  DosBase,a1
        SYS     CloseLibrary
        moveq   #$00,d0
        rts
    ; Clean up and return.

        SECTION our_data,data

DosBase:dc.l    0
DosName:dc.b    "dos.library",0
FileName:       dc.b    "PAR:",0        ; Change as you require.
Channel:dc.l    0
TextToSend:     dc.b    "This should pop out along the PAR: device wires!"
TextEnd:

        END
```

As far as your printer driver problem goes, I would recommend you wait and see if the JAM driver solves your problem before spending £80 on an operating system upgrade.

However, if you are going to be doing lots of development work its certainly worth considering upgrading as soon as you are able to. ***TS***

CDTV.. OR NOT?



I use an Amiga 500 (+1/2Mb upgrade) and I would like a CDTV. If I exchange for CDTV will my PD Library disc be compatible (with or without modification) or would I be better off fitting a fatter Agnus and buying the A570 CD-ROM?

B.Leyshon
Llanelli
Dyfed

Most PD demos will work fine on a CDTV (especially as it has *Kickstart 1.3 ROM),* although there are a few that complain. I'd say go for the Multimedia Kit upgrade deal, it's a real bargain and you get a brand new machine that you won't have to hack around. ***JR***

MIDI DUMPS



I own a Yamaha QY10 Sequencer. Can you advise me if there is any software that would allow me to do a bulk MIDI dump to Amiga disk and back. I am not concerned about editing the data, just transferring it. I have a MIDI interface and *Sequencer One!*

Alan Holman
Bridgewater
Somerset

The QY10 sends its bulk data out as a giant sysex (system exclusive) message and so, in theory at least, any program which can send and receive sysex messages will be able to do what you want. *Sequencer One* did not have sysex facilities but *Sequencer One Plus* does so, unless you want to experiment with a few pd offerings first, upgrading your sequencer seems a reasonable way of getting the facilities you want. ***PAO***

PC OF JUNK



I recently bought a GVP PC286 16MHz emulator for my GVP hard drive. It works fine for the most part with the exception of a few niggles. I have

installed the hard drive to boot *Workbench* at startup. However, if I want to re-configure the PC-286 I get a requester stating: "RCT Library? Cancel/Retry". The only way round this is to re-boot from the original disk, start the configuration from hard disk and re-configure from there. Do I need to copy the RCT library from floppy disk or is there some other method?

The graphics facilities of the emulator seems limited. It works fine in Olivetti V400 although this is basic with only monochrome for text and four colours for graphics. The alternative modes EGA/VGA, CGA and Toshiba either make my display flash with blurred flickering image or give nothing at all. Four colours in all modes is limiting, I would like 16 or more in VGA. How can I improve the emulator's performance?

David Morris
Beeston
Leeds

You are quite correct in assuming you will have to copy the RCT library to your hard disk — this is the fastest and easiest method. You can do this from *AmigaDOS* with the following steps:

a) Boot from your hard disk.
b) Open a Shell window.
c) Put the original configuration disk in the internal drive.
d) Enter the following command:

```
COPY DF0:LIBS/RCT#? TO LIBS:
```

From this point on, you should be able to start the configuration without any problems.

The graphics ability of AT-Once is limited and there is nothing you can do about it. In my experience, the AT-Once has always lagged way behind KCS in software — even though the hardware is, on the face of things, much better.

Since both these emulations are hard and software only the right combination will give good performance and I will say again, the KCS unit is the right choice for the vast majority of users. In my personal opinion, AT-Once could be greatly improved if Vortex spent more time developing the software rather than fiddling around with more powerful hardware.

The screen modes are controlled in software and the software is limited by the constraints of Amiga hardware. For instance, with a basic (1.2/1.3) Denise, you can only display up to 16 colour VGA and you must use interlace (flickering) display modes to display enough screen lines. The fact is, a computer using a standard television screen — including most monitors — can only display the equivalent of CGA without resorting to interlaced scan; the electronics just aren't designed to cope.

JARGON BUSTING • JARGON BUSTING

Assembly language – the programming language which is native to a particular processor. Assembly language is written as a series of short words known as mnemonics – these are translated directly into numbers for direct processing by the computer's micro-processor.

Bitplane/bitmap – a bitplane is an area of memory where every binary bit corresponds to a pixel on the screen. One bitplane represents a monochrome image, several can be overlayed (a bitmap) to represent a colour image.

Digitiser – a device which takes the analogue information taken by a source such as a video camera and converts it to digital screen information for use by a computer.

Dithering – the juxtaposition in varying densities of black and white (or coloured) dots to create a grey scale (or more colours).

HAM – Hold And Modify is an Amiga graphic mode allowing all 4096 colours to be displayed at once, with certain restrictions.

MIDI – Musical Instrument Digital Interface is a standard allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

The Amiga can only display 16 colours in Interlaced HiRes and that sets the theoretical limit on the number of colours displayed. Clever programming of the Copper can enhance this greatly. In practice however, programming Copper "on-the-fly" is hardly a practicable solution. HAM mode is, regrettably, out of the question too.

Real PCs get around all these problems by using specially designed monitors. For instance the one I use on a PC retails at £600 — considerably more than a Phillips CM8833. ***MS***

LOST BITPLANES

My problem concerns an IFF HAM file created using *DPaint 4.1.* Two backup copies of the file were somehow saved in 64 colour 320 x 512 format, rather than interlaced HAM. The files will display in 4096 colours using the "Display" utility of WB2, but will only load as 64 colour in DPaint. I know of no way I can alter the registers of the file back to HAM.

Is it possible to retrieve the file using a screen grabber whilst it is being displayed? I have PicSaver, but this does not work in HAM.

Can you help me get my pictures back?

Arlo Parker
Chelmsford
Essex.

Well, a bit of research shows that it isn't possible to restore a 64 colour picture to HAM because it no longer contains all the information which the HAM picture previously would have had. In simple terms, around 4000 colours have gone AWOL – permanently. So the doctor's opinion is that you've lost your HAM images this time. If it was a problem with *Dpaint 4.1,* report it to Electronic Arts, as this sounds serious. If you made a mistake, take more care in the future.

As for your comments about the 64 colour pictures loading in HAM in the Display program, there appears to be no way to tell what format is being displayed - so how did you find this out?

There are plenty of screen grabbers around including the PD program ScreenX. Check out a PD library for more details. ***GW***

DISK DILEMMA

I have just bought an Amiga 600 and also have a nearly new Commodore 1541 disk drive. Could you tell me if they make a converter to allow it to be used on the Amiga 600?

R Webster
Norwich
Norfolk

The 1541 disk drive was designed for the Commodore 64, it can hold a very small amount of data (around 180Kb compared to 880Kb on your Amiga 600 drive). There is an interface that allows you to connect it to the Amiga, but only for use with the Commodore 64 software emulator, and there really isn't any other sensible use for it, unless you have a desk with one short leg, or a door that refuses to stay open, for example. ***JR***

INCLUDING C

I have just embarked on the enormous task of learning 68000 assembly language on the Amiga using the *Devpac 3* assembler. I have also just acquired the *NorthC* compiler which does not include any of the Commodore header files. Is it possible for me to use the *Devpac include* files with *North C?*

Daniel Jeffery
Leeds

The short answer is NO and this is why: The files provided with *Devpac* are the '.i' include file versions which contain assembly language macros, structure definitions etc. The header files used by *C* programmers, although they effectively represent the same sort of system information, are in terms of content totally different - because the macros and other definitions are built using *C* language statements. ***PAO***

I CAN'T RESISTOR

Can you tell me the value of R914 on the Rev. 4.4 A2000 motherboard? Mine is starting to fail due to overheating and the browning has made the colour code unreadable. A friend of mine who is an electrical engineer suggested the resistor should be replaced before it fails (damaging something else) and its value cannot be measured since the overheating has probably caused a change in value. Also, is the A2000's clock battery charged by the computer or will it need replacing at some point?

RJ Cornford
Bath
Avon

The problem is actually more complex than it might first appear. Your friend is right to suggest the resistor has probably changed in value, downwards most likely, although a lot depends on the type of material used in its construction, carbon, metal film and so on; old machines probably used carbon.

That is not the problem. Passive components such as resistors don't usually just fry without a reason. Sometimes it can be a design fault, like a wrongly specified component — 0.25 W where a 0.5W should have been used. However it is more likely to be caused by the failure of an active component (transistor, IC) or a short circuit. This causes an increase in localised circuit current (Kirchhoffs first law) and heating in the affected components. This includes the ICs, resistors and in serious cases, even the PCB tracks. Given this, you would be better advised to investigate why the resistor overheated in the first place rather than just replace it. Better still, have the machine overhauled by a respectable service agent such as WTS Electronics at Luton.

The NiCad battery pack for the real-time clock is charged constantly by a low current charging circuit while the computer is switched on. Under normal circumstances it will run for up to two weeks on an 8-10 hour charge. It will fail eventually, typically

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after five to eight years of use — it's impossible to guarantee how long exactly. ***MS***

ASSEMBLING BOOKS



I will soon be purchasing *Devpac 3* for my A500+ and would be grateful if you could recommend the best books available. I'm aware of the ROM Kernel Manuals but what other books might I need? Secondly, is there any chance of seeing a regular assembly language series or does the size of assembler code listings make this a 'no go' area?

Darren Kemp
Leeds
West Yorkshire

The ROM Kernel Manuals are indispensable for anyone serious about programming the Amiga and you will also need a good general, ie non-Amiga, 68000 book (68000 Assembly language programming by Kane Hawkins and Leventhal and published by McGraw-Hill is the one I'd recommend). If you are new to 68000 coding however this is not going to be enough to get you over the initial hurdles and some sort of Amiga-specific tutorial guide is needed.

The bad news is that there hasn't been anything which I'd regard as suitable for newcomers to Amiga 68000 coding published. Now I don't usually 'blow-my-own-trumpet' but in this case it will be worthwhile waiting a few weeks – I have an Amiga-specific 68k coding book being published which may prove very useful to you (simply because it concentrates on explaining a lot of those Amiga-specific nasties that other books have not mentioned). The book itself, called 'Mastering Amiga Asembler', includes a disk, and it is being published by Bruce Smith Books (☎ 0923-894355).

As for a 68000 series? Listings are not really a problem and I think that if enough people bombard Andy Storer and Cliff Ramshaw with letters requesting a 'beginners 68k coding series'... the chances are quite high that you'll get one! ***PAO***

STILL SPACED OUT



Thank you for answering my question in your esteemed publication. Unfortunately the solution you suggested to cure the double line spacing on my Mannesman Tally MT81 printer does not work, as you can see from this letter. I am not a complete computer illiterate, and the printer has been in my possession for three years. I assure you that the dip switches are set correctly.

This letter was written on *KindWords* and printed using the EpsonXOld driver. I also get double line spacing when printing from PageSetter.

Neil Croft
Herringthorpe
S. Yorks

If you are getting double line spacing and it isn't the printer that is sending the extra line feed, then it is either the software or the printer driver that is sending it.

The double line spacing might be happening because there is an incompatibility between the software and the printer driver, or the printer driver and the printer. Mannesman Tally says the MT81 emulates an Epson FX-85, and Commodore says its EpsonX printer drivers will work with an Epson FX-85. If everything in Printers Prefs is set up correctly and you can't get your MT81 to work properly, someone must be lying.

This kind of problem is extremely difficult to solve remotely — by letter or phone I mean. I could theorise until the cows come home, but at the end of the day the only way to find out what's going wrong is to experiment.

Try other Epson printer drivers. Change the Paper Size and Right Margin settings in both Workbench Printer Prefs and within the software that is doing the printing; if the page width is set too wide this can often result in double line spacing. Switch the MT81 into IBM mode and try the MPS-1000 driver.

You should also try phoning Mannesman Tally Technical Help again. Avoid slipping into Mr Angry mode as this tends to put people's backs up. When I spoke to them about your problem their first reaction was that I should ask you to phone them.

It doesn't help that the software you are using are two of the buggiest and idiosyncratic programs ever written for the Amiga. ***JW***

JARGON BUSTING • JARGON BUSTING

C – a compiled language designed primarily for systems programming. It was used to write much of the Amiga's operating system, and is used in the writing of many Amiga applications.

Include files – supplied by Commodore, provide all the offsets needed to access system library routines, and the formats for all system structures.

Printer driver – a program that sits inbetween any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for a specific printer.

POWER UP

I have an A500, GVP Impact II+, Phillips Monitor, Amplifier and Citizen Swift printer. Right now I switch them on using their own switches, but I wonder if it would be OK to switch them on all at once using a 13A switched spur?

C Cheshire
Rotherham
West Yorks.

In theory, this is possible using a 13A 6-way adapter since none of the individual items draw a lot of standing current.

The switch on surge current shouldn't harm anything, but electrical items are fitted with individual power switches for your safety — and you should use them. If memory serves, the power supply on the GVP is controlled from the computer, so you could leave this on all the time. ***MS***

CDTV COMPATIBILITY

Using my CDTV with a 3.5" disk drive I have found some compatibility problems with some programs.

I believe this is my ROM chip causing the problem so would it be worth getting a ROM switcher, and if so, which one?

Matthew Laye
Colchester
Essex

The problem depends on what software you are running. There are actually three ROMS in the CDTV. One is the standard *Kickstart 1.3* ROM, the others are the CDTV ROMS (to control the CD Rom drive).

If you have software that should be compatible with *Kickstart 1.3* (such as most games) then it's the CDTV ROMs that are causing the problem. You can apparently switch out these ROMs with a hardware switch, although I haven't tried this yet!

Switching to a *Kickstart 2.04* ROM poses more problems. The CDTV can be upgraded to *Kickstart 2.04* but to do so requires all three ROMS to be changed, not just the Kickstart ROM.

The other two ROMS are currently not available to the public, although I am currently trying to arrange a way of getting these available through Commodore USA.

You will almost certainly have to add some more memory to your CDTV when you change Kickstart ROMS, as the CDTV gets very low on memory with only 1Mb of RAM and Kickstart 2.04. I have a CDTV with Kickstart 2.04 and 2Mb of chip RAM using the Meg-A-Chip board, and that works fine. ***JR***

ETHERNET LINK

I am about to start my third year at UMIST in Manchester, doing Software Engineering. I have managed to get into a student halls of residence which allows me the option of an Ethernet link in my own room. I own an Amiga 500 with both *KickStart 1.3* and *2.04* installed and 1MB of chip RAM.

I would very much like to be able to connect my Amiga to the Ethernet. I have been unable to find an ethernet card/adaptor for the Amiga. The closest thing I have managed to dig up is an ethernet adaptor for portable PC's, which plugs into the parallel port of the PC. Speaking to a network person from ICL, it became increasingly apparent that the driver software for the parallel port ethernet adaptor was horrifically complicated and would be difficult for me to write in my own time.

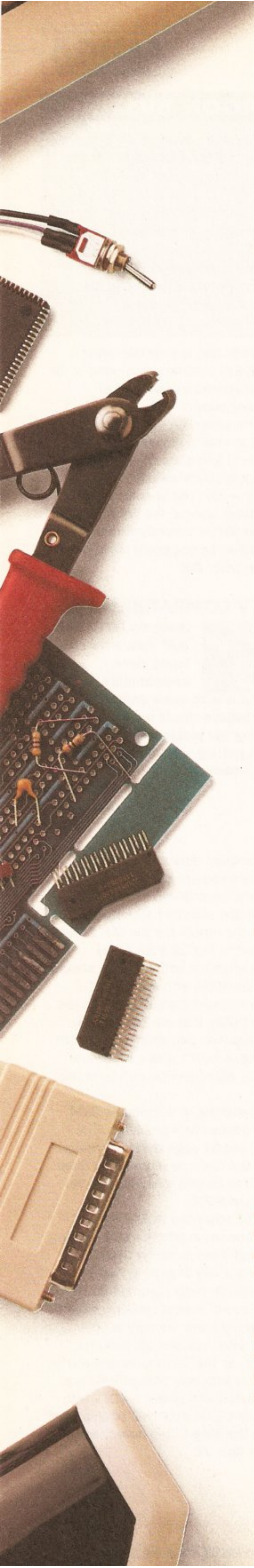
Do you know of any ethernet adaptors for the Amiga (If not the A500, any Amiga). Also, is anyone writing software to drive the parallel port adaprots?

The ethernet link is 10BaseT twisted pair, I don't know what protocol, I don't seem to have any information on it, but I think its TCP/IP.

Peet Lindsey
Dalton
Rotherham

The Commodore ethernet card is your best bet, but will not plug into an A500 I'm afraid, but plugs into a Zorro II or III slot in an Amiga 1500, 2000, 3000 or 4000. This can come with the NFS-TCP/IP software so you should be able to use it straight off. Its a pity you can't get an RS232 link into your room so that you could simply be a terminal onto the network. This was the way it worked when I was at university, and there were simply tonnes of RS232 sockets around the place. Armed with a portable PC and a serial cable, you could sneak into the library, plug in and go if there were no other terminals free! The card itself is the A2065 and will cost around 250 pounds. NFS-TCP/IP software is available separately, but you'll need it, and it costs around £100.

I did hear of a company making A500 ethernet adaptors but they are not SANA-II compliant, and you would be forced to use their software drivers. ***TS***



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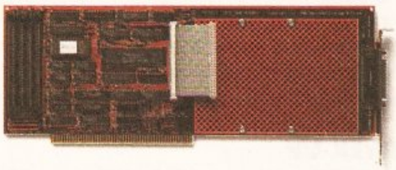
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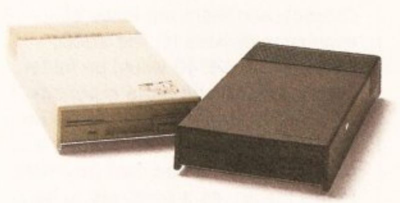
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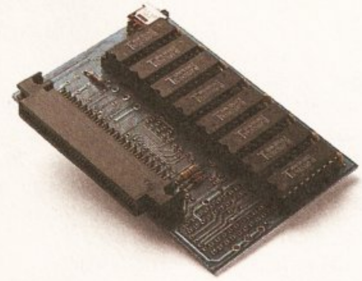
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CHEAP TRICKS



At the moment I am running my computer on an ITT television, which I want to sell and buy a monitor instead. The problem is that that the person who I was going to sell the TV to was told that running a computer on it would ruin it for normal use, and so they no longer want it. Can you tell me whether or not there is any truth in this story?

Chris Perkin
BFPO 104

Sounds like somebody is trying to get out of a deal, Chris. Whilst it is theoretically possible that you can irretrievably damage a TV by running a computer on it, what is most likely to occur is that through long usage a ghost image of the computer screen will become "engraved" onto the TV tube – this is the case with permanent displays in shops, banks and so on which just show the same information in the same place for months on end. It's also true that a TV tube will "soften" with use - but this occurs irrespective of whether it is being used as a TV or computer monitor.

Unless you've been running just the one screen continually, your TV should be OK. The obvious test is for the prospective buyer to have a look and see if it's what he wants.

In the meanwhile, here's a tip to monitor users – either use a screen blanker to blank the screen while it isn't in use, or better still, turn it off altogether, save some electricity and help cut down pollution emitted from power stations at the same time. Either way, you'll extend the useful life of your monitor. ***GW***

PS TO PC



I want to print from a PageSetter DTP file created on my Amiga on my friend's Canon bubble jet that is connected to his IBM compatible computer.

I understand that this can be done by saving my document as a PostScript file. Is this correct, and if so, how do I do it using PageSetter 1.2? If this is not correct, can you suggest another way of using my file in his machine?

S Palmer
Luton
Beds

PageSetter 1.2, which is the version that was given away free with Amiga Format, cannot produce PostScript output. Neither can *PageSetter II,* although the version of *PageSetter II* (called `Page') that comes with Gold Disk Office can output in PostScript.

But the Canon bubble jets are not PostScript printers anyway, so even if *PageSetter 1.2* could write a PostScript file it couldn't be printed on your friend's PC unless he has PostScript interpreting software that can print PostScript files to non-PostScript printers.

The files created by *PageSetter 1.2* cannot be loaded and printed by any computer but the Amiga. The simple solution is instead of taking the file to the PC for printing, bring the bubble jet to the Amiga. You'll need a proper Amiga printer driver for the bubble jet. Ring JAM on ☎ 0895 274449 and ask about the Canon Drivers disk. ***JW***

BOY RAYTRACER



Being a great fan of ray tracing I'm going to upgrade from my A500 to a brand new Amiga 2000 fitted with a GVP 50MHz 68030 Combo card, 240MB hard disk and 4MB of RAM. To improve the quality of my graphics I'm also thinking about buying a 24-bit card, but since most of my budget has gone on the Combo card I'm considering DCTV. I would be very grateful if you could answer the following questions:

a) Do you think I've made a good choice with the Combo, or should I go for a 68040 processor instead?

b) I've read some reviews about DCTV and I know its output is in composite mode. This means that whenever I want to see a DCTV image I have to switch from an RGB monitor to a composite one - or can I always have my computer connected to a composite monitor and display DCTV images plus Amiga graphics?

c) Do the images created with DCTV flicker, and if so what can be done about this?

d) Can I connect a SCART lead to DCTV and use this to display composite on my Sony Trinitron TV/ monitor? If not, can I connect DCTV to a Commodore modulator and then connect it to the TV aerial socket?

e) If I am playing a game and the DCTV is connected, will I have to use a composite monitor or can I use the normal RGB monitor?

f) I have a Commodore 1950 multisync monitor. Can I use this with DCTV?

Ruy Botelho
Portimao
Portugal

Hmm, now that the A4000 has been released you might just be better advised to go for that instead of your A2000/GVP/DCTV combination. You'll end up without the paint program and digitising offered by DCTV, but you'll get a 68040 processor instead, as well as all the new graphics modes offered by the AA chip set, lots of memory, a reasonably sized hard drive and a machine which won't be obsolete in the foreseeable future. And all for around the same price (probably) as you proposed spending in the first place.

On the other hand, the GVP cards are excellent (I have a 40MHz Combo), and there are loads of expansion devices for the 2000. Obviously, a 68040 would be faster, but also quite a bit more expensive.

Personally, I'd also hang fire on the DCTV and check out Centaur's new OpalVision 24-bit card (reviewed in this issue), as it promises to be a great product, and at a reasonable price. It produces RGB output which is transparent to Amiga graphics and can be used with any RGB monitor. Another viable alternative, which only costs a little more than a DCTV, is Archos' AVideo 24 card.

If you must have a DCTV, I'll tell you that it passes the Amiga RGB through, so that the Amiga graphics appear as normal – a composite monitor is only necessary to use the DCTV software and output DCTV images and animations. If you have a switchable RGB/composite monitor such as a Commodore 1084 this would be ideal for your purposes. Otherwise any monitor which can accept composite input can be permanently connected to DCTV's composite output, including your Trinitron. ***GW***

SCSI SOLUTIONS



I have some questions about GVP drives. I have an Amiga 500HD+ Series II and I want to exchange my 52Mb for a 240Mb drive, but I've heard that the 240Mb needs SCSI II and some of my friends say that the GVP is only SCSI I. What I would like to know is if I can fit in a 240Mb without any problems and can I use the same GVP disk to format it? The second question is can I upgrade this to the 40Mhz 68030 like the GVP A530? None of the stores have been able to answer my questions. I hope you can.

I have an upgraded Amiga 500 with Kickstart 2, Super Denise and 1Mb chip ram. I can easily change my workbench to SuperHiresLace, it looks nice, but what I would like to know is if there is a program like Deluxe Paint that can use this new format so I can draw pictures or features in a nicer resolution.

D Cullens
Hoogvliet
Holland

You can upgrade to the Quantum 240Mb hard drive without any problems, except you may not be able to get hold of one! Most Quantum drives have been unavailable in Europe for about a month now. If this is the case then the Maxtor 240Mb drive will also work fine in your GVP case, and yes, the GVP software will format and initialise the drive fine. SCSI 2 drives will work with SCSI 1 controllers (like GVP), although they aren't as fast as they can be with SCSI 2 controllers. I would also like to know if GVP will upgrade the HD+ to A530 with 40Mhz 68030. I, like many others, bought the GVP HD+ after being told By GVP and SDL (their UK distributor) in November 91 at the World of Commodore show that upgrades would be available. Now 1 year later I have heard nothing and I'm annoyed.

No doubt *Deluxe Paint 5* will support the new Super Hires mode (and all other modes like Productivity and the new AGA chipset modes) when it is released, hopefully soon. ***JR***

MIDI MIX



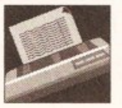
I'd like to know how to set up some sort of MIDI box to control two Amigas running the *Deluxe Music* Construction Set program so that I can use eight channels of sound.

Richard Brooks
Thorton Heath
Surrey

I've not used DMCS for many years and no longer even remember what facilities it had (MIDI or otherwise). I'll assume however that it has reasonably normal MIDI send and receive facilities and that these are explained in the manual. In general any sequencer type program which supports internal sounds and MIDI will do what you want and it should just be a matter of linking the two Amigas via a MIDI cable (MIDI OUT on the transmitting machine to MIDI IN on the receiving machine). The Amiga program that is receiving data should be set to play internal sounds data as it receives its MIDI information, and in effect is acting just like a MIDI sound module would (only it it of course using Amiga internal sounds). On the controlling machine, ie the one used to play 'song sequences' you arrange for the song tracks to play four voices as internal sounds and transmit four channels of MIDI data to the second machine.

This may be an interesting experiment but I wouldn't recommend the twin-Amiga approach as a general way of getting 'eight note' polyphony – a MIDI sound module would do the job better for a fraction of the price! ***PAO***

STAR TROUBLE



I have been given a Star LC-10 mono printer and am having some problems with

it. I own Pen Pal, Excellence! and Deluxe Paint III and IV. When I use the printer with the word processors the text comes out fine, but when I use the art packages the graphics come out completely different.

For instance, if I was to draw a circle the printer will it out elongated like a vertical ellipse, and it will have gaps between the various parts.

I am using the EpsonX[CBM-MPS-1250] driver, narrow tractor paper, and all of my patience! Please can you help?

Also, can you tell me how to het the Times, Helvetica and Courier fonts from the Extras disk to the Workbench disk?

Stephen Wheelan
Glasgow

Let's get the fonts problem out of the way first. Boot from your Workbench disk. Open a Shell or CLI window and enter the following command (there will need to be about 80K of free space on the Workbench disk for the fonts to fit, so make sure beforehand that there is room otherwise you'll get a "disk full" error message):

```
COPY EXTRAS1.3:FONTS TO
FONTS: ALL
```

That's assuming your *Extras* disk is called *"Extras1.3"*. If it's called something else, then replace the EXTRAS1.3 bit in that command with whatever the name of the disk is. You only have the one disk drive I notice, so from time to time you will be asked to swap disks. Simply follow the prompts.

Now the printer problem. Star changed the EPROM in the LC-10 quite a few times because it had a number of bugs in it, so there are many `versions' of the LC-10. Some work OK-ish, some don't. The problem is mainly with the colour model, and I've found that the mono model works well with the Star9Plus printer driver. You can get the very latest version from JAM on ☎ 0895 274449. JW

VIDEO CONFUSION

I write in the hope that perhaps you will answer my query concerning Gold Disk's Video Director program that your sister magazine, Amiga Format, reviewed earlier this year and has so far been unable to answer. I have written to them on two occasions and have been unsuccessful in obtaining a reply in their letters pages.

In his review, Jason Holborn said that he had used a Panasonic M7 camcorder and that it was compatible with the program. That's the problem – I too use an M7 and for the life of me I cannot get the program to work with this machine. I spoke to Jason about this at the Shopper Show and he informed me that another interface was required, and that I could get one from Dixons. But Dixons cannot help. Fax after fax to gold Disk in Canada have seemingly disappeared into the void.

So please lads, lend a helping hand – if you are able to, that is!

PD Clarke
Bordon
Hants.

HB Marketing, Gold Disk's UK distributor, is also seeking a solution to this problem. It would appear that a different lead is needed to connect to the M7. HB are in the process of bringing them over from Canada. Contact HB on 0753 686000 for more details. ***GW***

RAM LIMITATIONS

I have an Amiga 2000 which is two months old, it has *Kickstart 2.04.* I also have a Commodore A2286 Bridge Board and a Commodore A2630 accelerator card (4Mb 32bit ram) and a Microbotics 8-Up with 2Mb installed.

Do you know why I can only have a maximum of 6Mb of fast ram when my bridge board is installed. When tried to add another 2Mb of memory I got the message "AUTOCONFIG OUT OF MEMORY", what does this mean? According to the A2630 manual when you hold down the right mouse button, apart from the option to switch between the 68000 and 68030, another option should appear, UNIX. What is UNIX anyway, and how do I get it to appear?

I understand that there are two 64 pin connectors on the back of the A2630 board and that these are 32 bit memory connectors. Is there a product out yet which makes use of these connectors to let me expand my 32 bit memory? Is the A2630 fitted with the 68030 or the 680EC30? And finally, will any PC-AT 3.5" 1.44Mb disk drive work as a second drive when connected to the disk drive ribbon cable from my PC-AT bridgeboard?

D Whittingham
Honley
Hudersfield

The bridgeboard takes up 512Kb of the Amiga Autoconfig (8Mb) space, so you are limited to 7.5Mb of fast RAM, and as most RAM cards expand in 2Mb segments, this rounds down to 6Mb. The UNIX option was on early cards when Commodore were planning to release a version of the UNIX operating system for the Amiga 2000, however they never did release UNIX for the Amiga 2000 (in the UK anyway), so the option was removed. There is at least one RAM board that plugs in to the A2630 called produced (I believe) by DKB in the States, and allowing up to 112Mb of 32-bit RAM to be added.

The Commodore A2630 is now one of the few 68030 boards to use the original (and best) 68030 processor, not the cut-down 680EC30. Future versions of the Amiga Operating System may not work properly with the 680EC30 processor. And yes, you can use any standard 1.44Mb disk drive with the CBM A2286 Bridge Board. ***JR***

JARGON BUSTING • JARGON BUSTING

Bridgeboard – a plug in card released by Commodore for the A1500 and upwards which enables the Amiga to run programs written for the IBM PC series of computers.

Kickstart – the most basic and central part of the operating system.

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

PostScript – a powerful mathematical langauge used to describe graphics and text images to compatible printers. Because it does not rely on a pixel system, objects so described can be scaled and rotated without distortion or loss of detail.

SCSI – Small computer systems interface is the standard used for connecting hard drives, CD-ROM drives and tape back-up units to computers.

24-bit graphics – normally, the Amiga uses between one and five bits (binary digits) to store the colour of each pixel (picture element) of a display. This means that between two and 32 colours can be displayed. Hardware add-ons are now becoming available which use 24 bits per pixel, giving a possible 16.7 million colours.

A CASE OF MISTAKEN IDENTITY

While I was in Germany recently I was looking at Amiga products and saw a box marked A2300 genlock. The spec on the box was as follows: Genlock / digitiser Y/C SVHS Hi8 and the price was DM850 (around £300).

I contacted Commodore about this but got no reply. I enquired at distributors advertising in Amiga Shopper and drew another blank. Perhaps you could give the spec, quality, value for money and maybe a test report.

I am an absolute beginner waiting for my new A3000 to arrive.

M Wright
Pinxton
Notts.

I'm not sure exactly what's been going on here, but this definitely sounds like a case of mistaken identity. The *Commodore* A2300 GENLOCK is quite an old device which fits into the video slot of suitable Amigas and has composite video in and out, as well as an RGB connector for the Amiga monitor. By no stretch of the imagination can it handle SVHS or Hi8, and neither can it work as a digitiser. Also, they sell for around £100 or less in the UK nowadays, basically because they aren't particularly good.

On the other hand, the A2300 box you saw may have been something else altogether, containing a product not made by Commodore – though copying their numbers. There are loads of good German products that never see the light of day in the UK, but the amount of detail that you've provided isn't enough for me to be certain of what you are describing. Drop me a line if you have more information on it and I'll see what I can do about getting a review sorted out if it proves to be something new. ***GW***

CHIP RAM MOD

I have carried out the chip ram conversion as detailed in Amiga Shopper October 92 issue. With no trap door expansion in place the Amiga works as a normal 512k machine. However with the expansion in place, when I boot up the machine, the power light flashes and the screen is light grey in colour then turns to dark grey and back to light grey again and the disk drive is inoperative. No disk insert screen appears.

However, when the Action Replay cartridge is connected I press freeze to get into it and select memory control screen. I find that although chip 1Mb is highlighted, 512K is also highlighted as fast ram. What is wrong?

Timothy Weir
New Barnet
Herts

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INTERFERING VIDEO

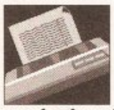


After replacing my old TV with a new 1084S monitor I found that when I feed video into it from my VHS deck I get diagonal green and blue lines across what is essentially a very good picture. I don't have this trouble with my Amiga 500 RGB picture. I have changed the phono-phono lead for a better one, but to no avail. HELP!!
Mark Jaques
Immingham
S. Humberside.

I'm not sure about this but it sounds like you are getting interference from somewhere affecting your video picture. Have you tried disconnecting the RGB lead while playing video? Also, is there a difference when the computer is turned on or off? It may help to keep your video cable separate from any other cables, especially printer and power cables, as these might also cause interference. Other than this, there's not much else that I can suggest you might usefully do. It's an odd problem. ***GW***

Kickstart 1.2 is the problem. You will need to fit *Kickstart 1.3* or *2.04* to use 1Mb chip ram. *Kickstart 1.2* is obsolete, many programs no longer work with *Kickstart 1.2*. ***JR***

DOTTY PRINTOUTS



Since upgrading my DTP package from *PageSetter* to *Professional Page 3* I have had problems with both text and graphics printouts on my Citizen Swift 9 colour printer.

The printouts are corrupted by dotted lines, which happens at all print densities, although to a lesser degree at lower densities. Initially I thought this was a printer driver problem, but after changing to the MPS-1000 driver the dotted lines were still printed.

I've also attempted to bypass Preferences altogether by using the Citizen Print Manager, but to no avail. What am I doing wrong?
Sam Aitcheson
Dyce
Scotland

First things first. Everything printed by *Professional Page* is graphics. Nothing is `text'. Even the words in *Professional Page* (and all other DTP programs) are graphics. Text printouts are pages that are printed using only the fonts that are built into the printer.

Now, from the example printouts you've sent me it looks like the dotted lines are being printed at the start of every `strip' that Professional Page 3 is printing – I'm talking about the `strips' that Professional Page says it is printing in the requester that appears while it is printing. This suggests a printer driver problem – corruption at the start of every batch of data being sent to the printer – but you say it works OK with PageSetter II, which prints in a similar way to Professional Page, so it probably isn't that.

The fact that you say Citizen's own Print Manager program – which presumably contains absolutely correct printer drivers for specific models of Citizen printers – produces similar results also suggests that it is not a printer driver problem.

Professional Page 3 has far greater memory requirements than *PageSetter II*, it needs at least 2Mb, and the dotted lines could be caused by a lack-of-memory problem as you have only 3Mb. Although a megabyte to spare sounds like a lot, you'll be surprised how quickly it can get eaten up. *Professional Page* will load itself into expansion memory, of which you have 2Mb, so most of the memory you have left will be Chip ram (which Professional Page 3 conserves to a fault) plus there'll probably be a very small amount of expansion ram that isn't big enough to be of much use.

Difficult to say for sure, but more memory might be the answer. You've not got enough to do anything very big in *Professional Page 3* anyway, so your money won't be wasted on another 2Mb. ***JW***

NO HELLO IN C



Having unpacked NorthC I've been trying to run the introductory 'hello world' program but when trying to compile it using cc I get 'cc unknown command' errors. I've tried everything but cannot compile nor link the program.
J Lejey
Newport
Isle of White

You actually asked a number of things in your letter but, for reasons of space and because we get a lot of queries about NorthC, I'll stick to giving a detailed answer to the problem shown above.

To start with it is worth pointing out that almost everyone has problems with C compilers, and the related task of creating compiling environments, in the beginning. With all public domain, and other non-commercial offerings, these problems are made worse because the documentation is scattered around the disk as a selection of readme/doc files (as opposed to being in a printed manual).

There is actually a reasonable amount of documentation provided on the NorthC disk and now that you have unpacked the disk it would be a good idea to print out all of the readme/doc files that you can find. You won't understand it all but believe me it does help to have a hard copy to refer to. Amongst these files you'll find compiler, assembler, linker and library documentation, notes about creating bootable disks, some NorthC questions and answers and plenty of code examples.

As far as creating a *C* environment goes this is also explained in detail on the disk and Steve Hawtin has provided some quite flexible script files which do all the setting-up operations for you. What is explained in less detail however are the reasons why various things have to be done but I think that if I tackle these things the reasons for some of your difficulties will become apparent.

First let's look at the compiler tools (cc, NorthC, a68K, blink and so on). These, as you've probably realized, are held in the 'bin' directory of the NorthC disk BUT... copies of these programs can be moved anywhere - it can, for example, be convenient to copy these tools to the ramdisk when using a 1Mb single-drive system. The important point is that, one way or the other, the system needs to be able to find these tools during the compilation process. In a similar fashion the compiler will need to know where to look for any include files and it, or rather the linker, will need to know whereabouts the library functions can be found.

As I've mentioned, NorthC provides a series of script files - you should also print out, and study, the ones called Setup-NorthC, Single-Make and Single-Disk because these files are the ones which allow you to set up your compiler 'environment' automatically. Now all of this is explained in the disk documentation and there's little point in repeating it. There is however nothing 'magic' about these files and it is just as easy to create alternative arrangements.

Here's an alternative scheme/explanation which should give you the starting point you need: After booting up from your WorkBench disk, open a CLI and type (as two separate commands) these lines:

```
setenv INCLUDE
NorthC:include/
assign clibs: NorthC:clibs
```

These statements will tell NorthC where to find the include files and the library files (you'll be asked to insert the NorthC disk when you type theassign command - insert it, and when the '1> prompt' reappears replace your WorkBench disk).

Now copy the 'copy' command to the ramdisk using the command:

```
copy df0:c/copy to ram:
```

and then replace the NorthC disk and copy its compiler tools into the RAM disk using these instructions:

```
ram:copy df0:bin/cc to ram:
ram:copy df0:bin/NorthC to
ram:
ram:copy df0:bin/a68k to ram:
ram:copy df0:bin/blink to
ram:
```

Finally insert the WorkBench disk and type...

```
cd ram:
```

SOUND ADVICE



I should like to be able to create sound files consisting of either music or sound effects which can be loaded into my own programs and played under my own control (in the same way that DPaint IFF files can be used for Amiga graphics). What do you recommend as the audio evquivalent of DPaint? How can I find out about the structure of the files created by the package you suggest? Are there any Amiga music books that might help?
Alun Evans
Swansea

For playing sounds in your own programs you need a tracker package that will create songs and effects based on Amiga internal sounds. The bad news is that while there are some brilliant MIDI music programs there's no tracker program that provides a musical environment equivalent to DPaint. There is however a program called OctaMED Professional which is one of the better quality tracker programs. Fortunately the package includes a lot of technical info for programmers (including code for incorporating play routines and general file structure details). The program costs £22.50 and is available from: AmigaNuts, 169 Dale Valley Road, Hollybrook, Southampton SO1 6QX.

As far as Amiga music books are concerned there isn't much available. The ROM Kernel Devices manual covers the workings of the Amiga's Audio device, and there is an Abacus book called 'Making Music on the Amiga' (written by Spanik, Tai and Hahn) which might be a certain amount of use. ***PAO***

to make the RAM disk the current directory.

Since the current directory assignment is now the RAM disk all of your source files and intermediate files will now be automatically placed in the RAM disk as they are created. More to the point your compiler tools (including cc) that you need are now all in the current directory as well, so you won't have to worry about using filepaths etc to identify tool locations.

Your first example program ought to be the 'hello world' program that you mentioned so create a source file (using the ED text editor) by typing:

```
ed hello.c
```

and enter that famous C program, namely:

```
#include <stdio.h>
main()
{
printf("Hello World\n");
}
```

Save it (by using ESCape followed by X) and then compile the program using the cc command:

```
cc -ohello hello.c
```

On a single disk machine you will be asked to swap your NorthC/WorkBench disks a couple of times, but that, in this paricular example, is all there is to it. Your program, called 'hello', will be sitting in the ramdisk waiting for you to run it by typing its name at the CLI window! Once you got this to work, and have come to terms with the purposes of assign/setenv etc., you should be in a position to create whatever compiling environment you want. ***PAO***

PC FORMAT DISKS

I am using Deluxe Paint III to design artwork for my small promotional leaflets. My problem is thatafter after blowing all my money on buying the computer, I'm still a few months off being able to afford a decent printer. But I need to get some of the artwork printed now.

A friend has a laser printer attached to his PC and has said that he will print it for me if I can transfer the files to PC readable disks. Can you recommend a PD program that will do the job? It has to work on the A600 and be useable by a complete amateur.

Graham Betts
Leicester

What you need is *MultiDOS*. It's not made it into the Fish Disk collection yet, but any PD library should be able to provide you with a copy.

Make sure you get *MultiDOS*, not *MessyDOS*. You don't want *MessyDOS*, it's a bit buggy and a real bugger to set-up if you don't know what you are doing. *MultiDOS* is a lot easier to get working, and I've yet to have a single problem with it.

Also keep in mind that your friend will need to have PC software that read IFF-ILBM format graphics. Either that or you'll have to convert your artwork into a PC graphics format before transferring it on to the MS-DOS format disk. There are several PD graphics conversion utilities available that might help. Ask the PD library about this at the same time as getting *MultiDOS.*

And remember, if the PD library you call first sounds puzzled or `doesn't know', try another library, and keep trying till you find one that does understand and wants to help. In general you'll find that the libraries that charge a little bit more do so because they are prepared to spend a little more time trying to help you. ***JW***

VIDI SWITCH TURN-OFF

Cutting a long story short I recently bought a Rombo VIDI Amiga 12 digitiser from First Choice computers in Leeds. When I got it I found that it wouldn't fit the parallel port of my Amiga 1500, nor was there a pass-through for my printer.

First Choice advised me that I would need to purchase an extension cable from Rombo and also a 2-way data switch to share the parallel port.

I duly got hold of these items, connected them up and found to my dismay that the V.A. 12 refused to work with the printer attached, though it worked fine on its own.

First Choice then told me that the V.A 12 *would not* work with the data switch. I wrote to Rombo explaining the situation and asked whether they could make up a cable to solve my problems.

Rombo replied that they had sold hundreds of switch boxes to Amiga 1500, 2000 & 3000 users and that they had never had any problems.

They did mention that it could be a fault with the "strength" of my Amiga's parallel port, as they had experienced some problems with A1500s in the past.

I was advised that this was Commodore's problem, and not Rombo's. But as we all know, there's no point in calling Commodore!

I'm now confused about the whole thing. I'm told that I need a switch box, and then that it won't work.

And if my A1500 is up the chute then what if it was like that when it was produced? It's 18 months old now and out of warranty - so what can I do?

Ken Ward
Oldham.

Ken, I spoke to Rombo Technical (0506 414631) about your problem. The people there assured me that there should be no reason why your switch box wouldn't work - as you mention, they have hundreds of satisfied customers - even if you didn't buy it from them. They did point out that the cable between the VIDI and the switch box should be as short as possible (preferably less than half a metre) and of flat ribbon style, not rounded cable. The reason for this is that the data is passed at high speed through the cable and longer (and rounded) cables tend to cause interference and therefore problems.

So, if you haven't already tried it, get hold of a shorter, flatter cable. If that doesn't solve your problems it may be as you suggest – that your parallel port is in trouble. This can be caused by poor quality CIA chips being used, or by a fault caused if you have plugged anything into the port while the computer was "live". This is far easier to do than you might suspect - I've blown the CIA's on my Amiga 2000 in the same way! If you suspect you have a faulty computer the only thing you can do is contact your dealer, or Commodore if all else fails.

I've passed your details onto Rombo and they promised to follow up this enquiry. ***GW***

CONNOR CHAMELEON

Is it correct that the 60Mb GVP HD8+ hard drive is a Connor drive and not a Quantum drive? If so what is the difference in speed between the two? As I purchased the GVP drive on past tests/writeups claiming it to be the best and fastest, I feel concerned that I may have a slower drive. I rang the dealer from whom I purchased the drive and he told me that the Connor drive was fitted because of a shortage of 52Mb Quantum drives. He also told me that the Connor drive was only slightly slower than the Quantum drive. Could you verify or otherwise these claims. If the speeds are more or less the same then I got a bargain as I was charged the same price as the 52Mb version.

B Smith
Chase Terrace
Walsall

Yes, your dealer was correct when he told you that Quantum 52Mb drives are a bit on the rare side now. Big PC manufacturers like Compaq have pre-booked Quantum ProDrive production for the next six to eight months, so it's unlikely you will see many Quantum drives on sale before Spring 93. GVP and other companies have had to find alternatives at short notice, and the Connor 60Mb is one of the few SCSI drives now available under 200Mb. The Maxtor 120Mb drive has replaced the Quantum Prodrive 105Mb and 120Mb drives with most suppliers. Many suppliers are now dropping all SCSI drives below 100Mb (and below 300Mb in some cases). Even 60Mb Conner drives are difficult to source now, so the 120Mb will soon be the smallest SCSI drive available.

As for your question, were you conned with a Connor? Well, that decision has to be up to you. The difference in speed between the two drives is so little that only the most pedantic disk performance programs will complain. ***JR***

SCART OUT AGAIN

For a long time I have used my SCART TV as a monitor for my computer. I have recently bought a video and I would like to run my Amiga 1500 through the video and then into the TV.

Plugging my computer's SCART lead into the video's SAT input only produces a black screen, though the sound still works. The name of a supplier of a lead which would work would be appreciated.

James Talbut
Brighton

I think you have a lead for which the connections do not tally with the Sony's input. My guess is that the Amiga lead is RGB and the Sony needs a composite video input. Try Meedmore Ltd ☎ 051 521 2202 or Trilogic ☎ 0274 691115.***GW***

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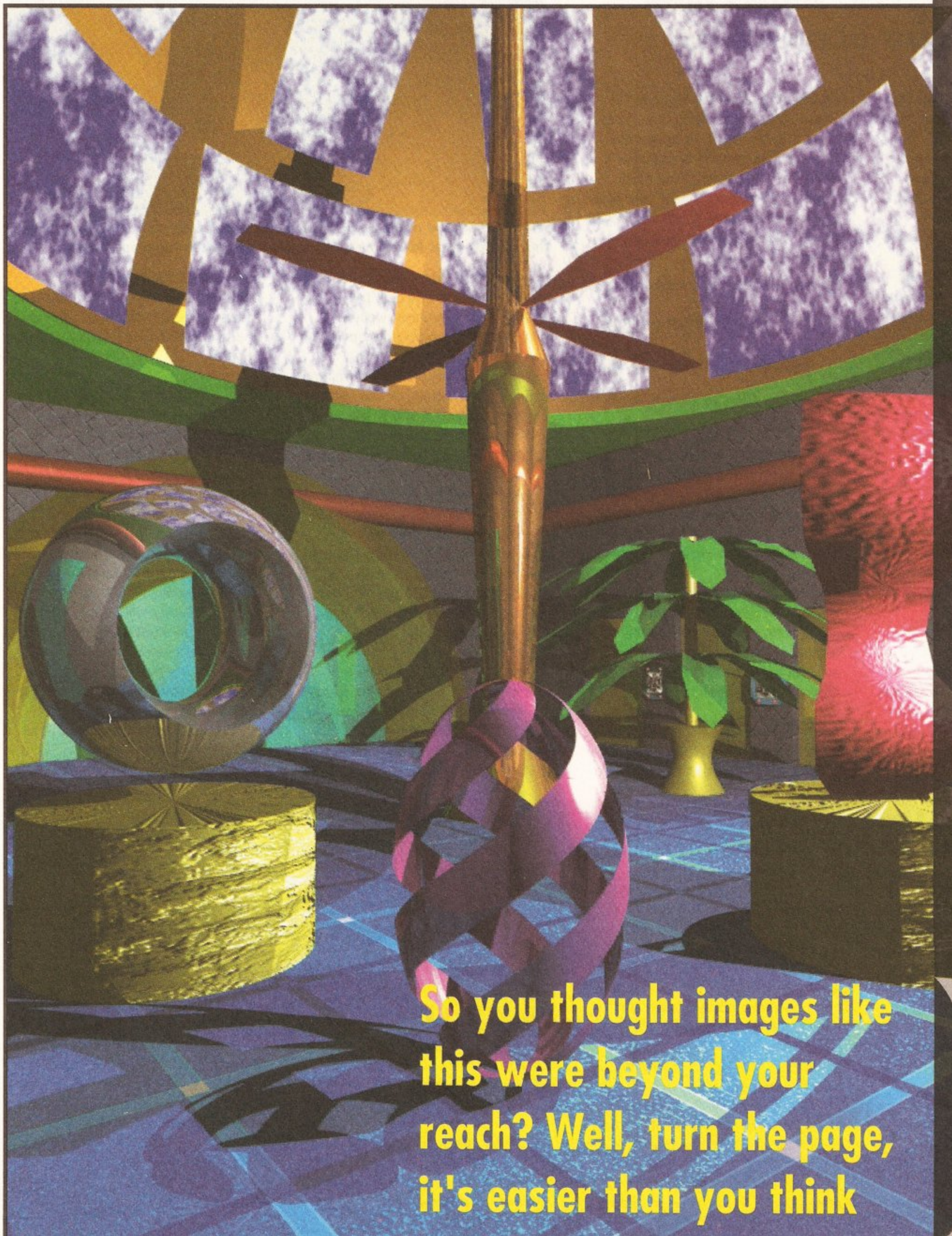
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RAY TRACING

MAKING LIGHT WORK

. . . or how to push your imagination to its limits



So you thought images like this were beyond your reach? Well, turn the page, it's easier than you think

3D Made Easy

Jason Holborn unravels the mysteries behind the modern art of ray tracing and shows how you too can get in on the act



With a little bit of patience, you too could be creating ray traced images of this quality – just follow our comprehensive guide to the procedure!

They say that the best way to learn a complex subject is to be thrown in at the deep end. Whether you're learning to drive, taking a crash course in llama husbandry or just trying to suss out the London underground, there's nothing like a bit of practical experience to put you on the right tracks. Take ray tracing, for example. As you will no doubt know if you've already tried your hand at this seemingly impossible-to-master application, no amount of techie-speil is going to teach you the basics.

Back in the days when ray tracing was still a relatively new application, I suffered no end of frustrating rendering sessions – although my ray traced images looked great as wireframe representations, they never quite fullfilled their full potential once rendered. Most of the time, all I ever managed to get was a couple of sparkling dots on a largely black background. The disappointment wouldn't have been so great if I hadn't had to wait 12 hours for the damned thing to render! I'm sure that this experience is not common which could explain why ray tracing has unduly gained itself such a bad reputation.

Thankfully the quality of ray tracing programs has improved in leaps and bounds since those early days. Ray tracing is no longer the impossible-to-master application it once was. With just a little bit of practical experience under your belt, you too will be able to create images that rival the sparkling handiwork adorning these pages.

> ***"A bog-standard 1Mgbyte A600 is more than enough"***

Ray tracing isn't so complex after all, so don't dismiss it as something best left to the pros – get yourself a ray tracing package and you too will be amazed at what you can do! You don't even need a porky Amiga either – a bog standard 1 Mbyte A600 is more than enough to get started. A processor accelerator certainly helps (ray tracing complex scenes can take a very long time to generate), but it's not really that necessary – I just left my machine on overnight!

SCHOOL DAZE

So how does it work? Well, let's take a quick trip back down memory lane to your school days. Physics lessons were generally pretty dull, but – looking back – you may well be surprised to learn that the boring sir who used to plague you with questions on the index of refraction actually knew a thing or two about ray tracing. Fact is, it's simply a mathematic technique which emulates how we see objects in the real world.

As your old physics teacher would tell you, when we look at an object in the real world, we're not seeing the object itself, but the light that is reflected by that object. If you don't believe me, ask yourself this question – why can we see things during the day but not at night? What's the missing link? Light, of course! Put simply, our eyes are effectively very complex data capture devices. All they do is to convert the light that falls onto the back of the eye (the retina) into electrical pulses that are built up into an image by the brain. Ray tracing packages are based around pretty much the same theory – in many respects, your brain is essentially a very fast ray tracing program!

THE VIRTUAL WORLD

Generating a ray traced image primarily envolves two steps – ray tracing and solid modelling. As we have already seen, the process works by calculating the colour of the light that is reflected by a particular object. In the real world, these objects are all around us, but where do they come from in the virtual world inside your Amiga? While the Amiga will happily handle the job of generating the ray-traced image (don't complain – this is the hard bit!), it's down to you to build up the 3D world that the ray tracing algorithm works on.

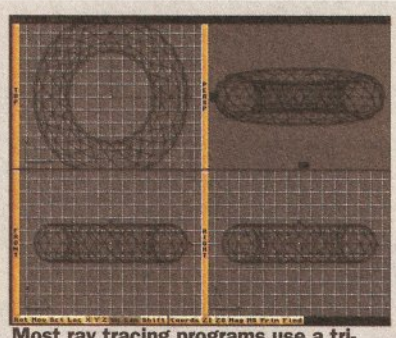
Creating a 3D universe isn't as complex as it may first seem. For a ray tracing program to produce an

UNDERSTANDING 3D EDITORS

We've already seen how ray tracing attempts to emulate the effect of light in the real world, but that's not where the similarities between ray tracing and the world around us end. We live in a three-dimensional universe that not only has height and width, but depth too. Emulating this sort of environment on a flat 2D screen is by no means easy, but ray tracing packages use perhaps the best method available – tri-view editors.

Pioneered by Eric Graham's Sculpt 3D, the tri-view system is used by virtually all ray tracing and solid modelling programs to allow us to create 3D 'scenes' on the rather limiting 2D medium that is your TV or monitor. As the name tri-view suggests, the tri-view system presents you with three flat 2D 'plan' views – front, right and top. In more sophisticated systems, you're usually also given an extra perspective view which displays the scene or object you're editing in true 3D perspective.

In a tri-view editor, the virtual world is based around a set of three co-ordinates – X (left and right), Y (up and down) and Z (in and out). Using these three sets of reference co-ordinates, it's possible to move



Most ray tracing programs use a tri-view editor which displays the 3D world inside your computer in three views – front, right and top

around the 3D world, spinning, resizing and moving objects to your heart's delight. I know that it sounds like a rather confusing system, but you'll be surprised just how quickly you get used to it.

Creating 3D objects using these three views isn't the most natural way of working. By the very nature of the world we live in, we humans are more used to working in true 3D. Some more recent programs have attempted to adopt this method of working (Caligari, for example) but it usually doesn't work that well simply because the Amiga's line drawing hardware can't update a complex 3D perspective view fast enough to allow us to move around a 3D scene at a comfortable rate. As the speed of the Amiga's hardware increases, developers will be able to more readily exploit true 3D perspective displays.

image, your 3D 'scene' must contain at least four very important elements – a light source (without light, you won't be able to see a thing), objects (a light source is no good unless it has something to illuminate), a viewpoint (your position in 3D space) and a location (the point in 3D space which the viewpoint focuses on). With these four basic elements in place, all the ingredients are there to create a ray-traced image.

Of the four elements, the most complex to create are objects. In an ideal world, everything would be exactly the same shape and size, making the process of emulating this world far easier. But, thankfully this isn't the case (imagine how dull life would be!), so the task of creating real world objects in a 3D editor is far more complex. Programs such as *Imagine* use a system of primitives which are basically building blocks which can be stretched, squeezed, rotated, skewed and generally messed around with until you get the shape you want. For more complex objects, you can also group several primitives together to form your chosen object. Take for example a 3D model of a human hand – When constructing such a complex object, you should start by breaking the object down into its component parts. In the case of our hand, we'd need a wrist, a palm, a thumb and four fingers. And, because the arm is not solid, it needs to be articulated.

For the sake of an example, let's take a look at how you'd construct a finger. Starting from the base of the finger, you could build it up in a 3D modelling program using a tube, then a sphere for the joint, another tube, yet another sphere, a tube and finally a distorted sphere for the finger tip. Once one finger was complete, it's simply a matter of copying this grouped object three times, scaling the copied versions so that they're the correct size and you're away. Then all you'd have to do is to create the rest of the hand using the same technique.

Once the basic shape of the object is complete, you can then assign attributes to that object that will dictate how it will behave when the lamp (or lamps) that light your 3D scene are shone onto it. As the most basic level, this usually involves assigning a colour and a material to that object – colour is pretty self-explanatory, but the material is somewhat more complex. The material dictates what the object is made of – it could be anything from dull metal or plastic, to chrome or (for really spectacular results) glass. The 3D editor emulates these materials by adjusting parameters such as the shininess of the object, its hardness, how reflective it is, etc.

More complex 3D editors also allow you to wrap pre-defined textures around objects. These mathematically-calculated textures allow you to use textures from the real world, including wood (complete with a nice grain effect), stone, brick and even a nice watery wave effect. Be warned though – once you start using such complex textures, the time it takes for the ray tracing program to generate your scene can escalate beyond your wildest dreams!

More recent modelling programs also allow you to wrap any IFF brush around an object or even 'bump map' a brush. Bump mapping is a process whereby certain user-defined colours are raised when the brush if rapped on the object, giving the illusion of a far more complex object. A good example of this is the tea-pot in the picture elsewhere on this page – this beaten brass look was made simply by wrapping an IFF brush onto a smooth object using bump mapping.

MAKE A SCENE!

Once all your objects are complete, you're ready for the final stage in creating a 3D universe – all that now remains is to create a 'scene' containing all your 3D objects, at least one light source, a camera position and a location for the camera to focus on. The first stage is to load in all your objects one by one and then position them where you would like them to appear in 3D space using the same style of tri-view editing that we used to create these objects in the first place. Once they're in place, you must then create a light source and position that too. A word of warning though – never position your light source too close to the objects that it must illuminate. If you do, you may well find that the light source floods the scene too much, producing an image that is simply too bright. A much better bet is to put that light source at quite a distance away from the objects. This way, you'll get an even spread of light across the scene.

Positioning the camera and the location point must be carried out at pretty much the same time. Just like in real life, the camera must be pointed at the subject that you wish to 'photograph'. The easiest way to do this is to use the 'Retrack' option that many ray tracing programs offer – this option allows you to set the direction that the camera points by aligning it with a particular object. Once you're happy with this, do a quick test render using the fastest rendering mode that the program offers just to be absolutely sure that everything is in order. If it is, it's time to unleash the program's ray tracing algorythmns on your 3D scene. Fingers crossed, you should get some pretty spectacular results...

TUTORIAL HEADING

Who says ray tracing is tough? Don't you believe it! Work your way through our step-by-step guide and you'll soon be tracing away like there's no tomorrow!

Just to prove to you just how easy constructing and then ray tracing a 3D scene really is, we present what must surely be the most comprehensive tutorial ever written demonstrating the subtle art of ray tracing.

Over ther next three pages we'll take you step-by-step through the entire process, highlighting the major stages in great detail. As you can see from the final image, even the most simple of scenes can produce some fairly startling images providing you arrange and light your scene correctly.

Although ray tracing and solid modelling requires a pretty keen mind for 3D, it's equally important (if not more so) to have a keen eye for what looks good.

Science and art rarely meet in the real world, you'll soon come to realise that the two realms are but one and the same, once you start to tinker away!

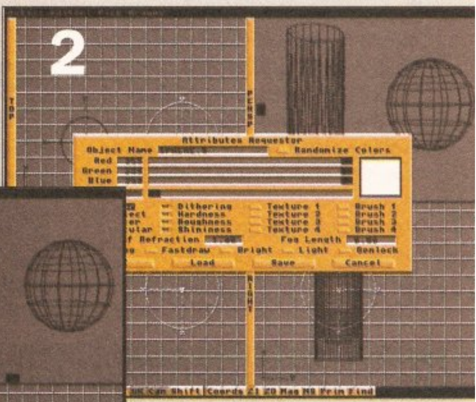
Although this tutorial is based around *Imagine 2*, Digital Multimedia's excellent 24-bit system, much of the theory discussed can be applied to just about any ray tracing system, regardless of whether it costs £40 or £400.

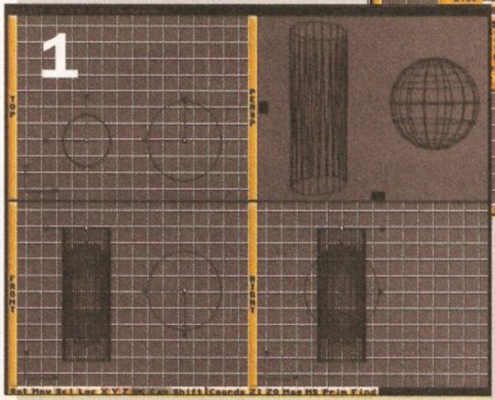
Don't think that the process requires a fairly potent Amiga either – this entire tutorial was produced using a standard 68000-based Amiga 2000 with just 3 Mbytes of RAM (of which 2 Mbytes is stolen by *Imagine!*). You'll find a full round up of the packages available to suit your pocket later on in this feature.

Anyway, let's get back to the serious business of building our virtual world...

1 Armed with a copy of *Imagine*, we're ready to start. The first step is to create the objects that will inhabit our 3D world. *Imagine* offers two object editors – the Forms Editor and the Detail Editor. For this sake of this tutorial we'll ignore the Forms editor and plough straight into the Detail Editor.

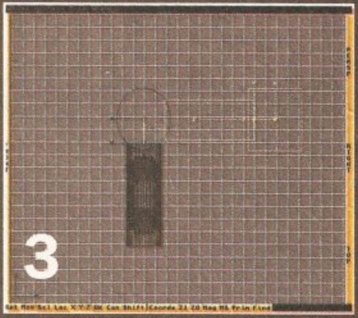
The object that we shall be using in this tutorial isn't available ready-made, so we'll have to construct it ourselves using the primitives that *Imagine* offers. In this case, we need just two primitives – a sphere and a tube.

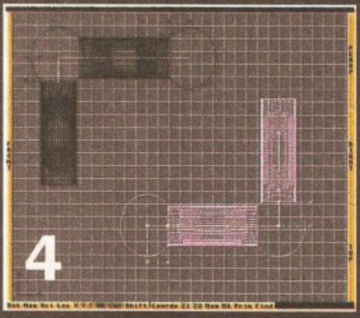


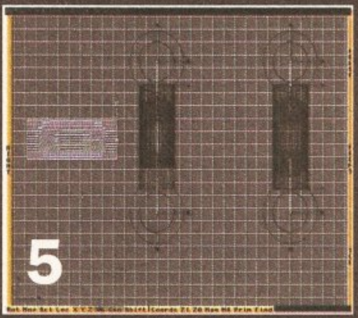


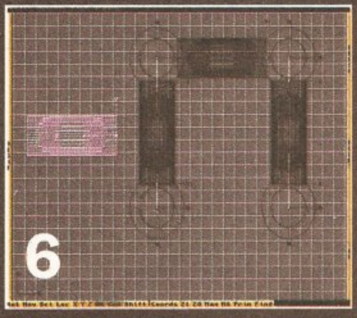
2 Before we can start constructing our object, we need to set the attributes for both. We can either set all the various attributes (colour, shininess, hardness etc) manually or use a preset attribute set. In this particular case, *Imagine* already provides a preset attribute set for chrome that will suit our needs. All that we need to do is to load this attribute set and set the colour – for the sphere, the colour should be white. Once this is done, click on the 'OK' gadget, select the tube and then repeat the process for this primitive. Once again, we want the tube to be chrome too, so we can simply load the same attribute file in again although this time we'll set the colour of the tube to green.

3 With the attributes for our two primitives defined, the next step is to fit them together. Before we can do









this though, we need to reduce the diameter of the tube so that it retains its length but isn't so wide. Imagine allows us to scale an object in any combination of the X, Y and Z axis. In this particular case, the tube is scaled along the X and Y axis.

Now that the tube is the correct size, we simply select it again, click on the 'Move' gadget and then drag it into place. Once you're happy with it's position, press the space bar and the object will be deselected. Now that both objects are correctly aligned, we no longer need to treat them as to separate primitives. Using the 'Group' option in the 'Object' menu, we can join them together to form a single object.

Once grouped, we then need to copy the object, rotate the copy by 90 degrees and then position the copy so that it lines up with the sphere of the first. Once the copy is in place, we can put these two objects together to form an even larger single object.

JARGON BUSTING • JARGON BUSTING

Primitive – Primitives are very simple 3D objects that are used as building blocks for your own objects. By manipulating these primitives and then joining them together (called 'grouping'), some quite complex objects can be created. Most 3D modelling programs offer pretty much the same selection of primitives – a sphere, a disk (a flat circle), a plane (a flat square), a torus (a doughnut shaped object), a tube and a cone.

Object – Objects are individual 3D elements which you create to inhabit your 3D universe. Built up from primitives, the shape and complexity of an object is limited only by your grasp of the 3D modelling program that you use and your own imagination. Most 3D modellers allow you to build up a 'library' of objects which can be used over and over again in your 3D creations.

Scene – A scene is a collection of objects and light sources that are positioned in such a way so as to produce the image that you want. For a scene to work, you must also set the camera position and the target position that the camera focuses on.

Light Source – Because ray tracing programs produce images by calculating the effect of shining light onto objects, it's very important to add light to your scene by adding one or more light sources.

4 The next step is pretty much the same as the last. Using the object that we created by grouping together the much smaller primitives, we create a second copy which is then picked up, moved away from the first and rotated 180 degrees along the Y axis. The two halves are then positioned and then grouped to form a single object.

We now have the front face of our cube.

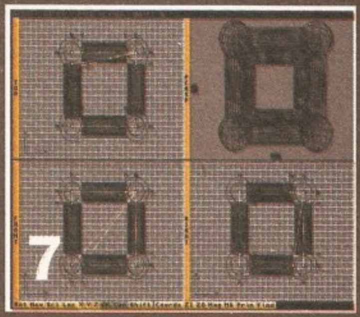
5 Swapping over to the right hand side view, we need to make a second copy of this front face for the back face of the cube. Once again, all we need to do is to select the object we already have, click on the 'Copy' option and drag the copy to the right of the first, therefore effectively moving it backwards in 3D space. All that now remains is to create the four tubes that will join the four corners of the two faces together. Using the 'Add Primitive' option again, we create a tube and then scale it so that it is exactly the same dimensions as the tube that we created in step 1.

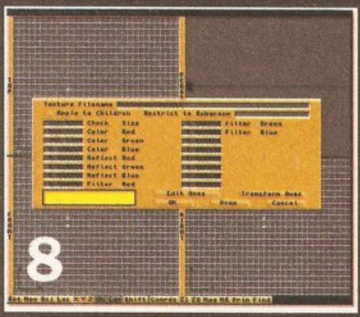
6 Now that the tube is the correct size, we should make a copy of it and drag the copy of the tube into place. It's unlikely that the two faces are exactly the right distance apart for the tube to join them together exactly, so you'll probably have to reposition the right hand face (the one at the back) so that the two faces are at exactly the right distance for the tube to fit snugly. Once the distance is correct though, we can then carry on with copying and then positioning the next three tubes. To position the two tubes on the left hand side of the cube, you'll need to swap back to the front view to position them along the X axis (the side view editor will only allow you to put objects along the Y and Z axis). Once all the tubes are in place though, the final step in constructing this object is to group the whole lot together to form a single object.

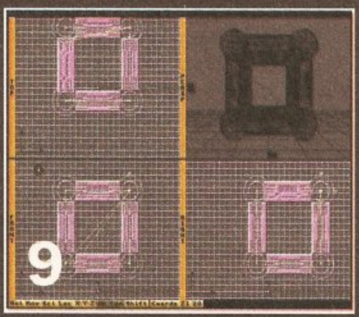
7 Our first object is now complete, so we can swap back to the tri-view editor to view it in all its 3D glory. If you wish to see the perspective view in greater detail, simply click on the 'PERSP' bar and Imagine will generate a full-screen wireframe representation. Once you're happy with the object, save it off to disk for use later on.

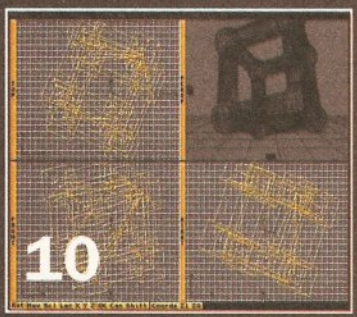
8 With the cube finished, we can start work on our second object, the ground. Unlike some older ray tracing programs, *Imagine* treats the ground as just another object. So without further ado, select the 'Add Ground' option. By default, *Imagine* sets the ground to exactly 320 by 200 units which is a bit small for our purposes. We can therefore enlarge it using either the 'Scale' option or – for more precise results – the 'Transform' option. The Transformation option is perhaps more suitable for our needs: it allows us to both scale and object by a percentage value or to state the exact size of an object in units. In this case, the size of the ground was set to 600 by 600 units.

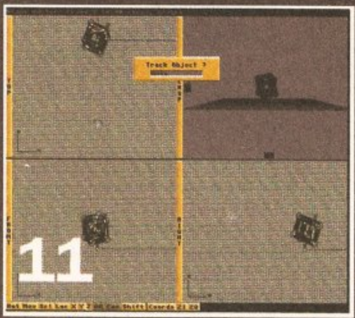
Once the size of the ground is set, we can then assign a set of attributes to the object. Here we want to create a chequered effect using the 'Check' texture supplied with *Imagine*. Select the ground, click on 'Attributes' from the 'Object' menu and then click on 'Texture' and a file requester will appear. Click on 'Checks' and the requester for this texture will pop up onto the screen. Set the Red and Green values to 256 (to create a yellow) and select 'OK'. Save this object off to disk too and

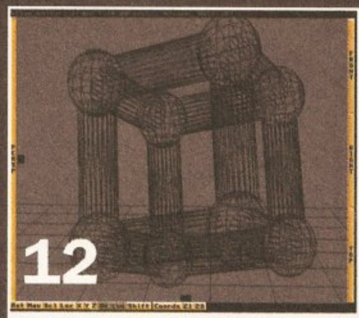


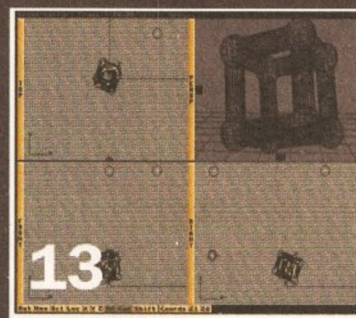


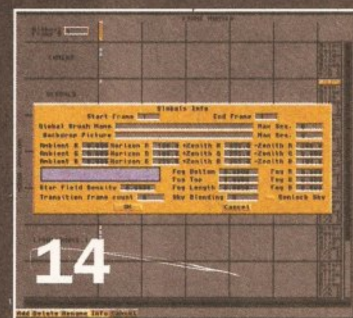












we're ready to start work on our scene.

9 With both objects complete, we can leave the Detail editor and start using the Stage Editor, the part of Imagine that constructs the scenes the ray tracing algorythmn works upon. Start by loading in both objects and then position the ground (using the 'Move' tool) so that the cube "floats" directly above it.

10 It all looks rather dull, so we can make it more exciting by rotating the cube to give a greater 3D impression. *Imagine* allows us to rotate any object along all three 3D axes, so just select the cube, select X,Y and Z rotation and then drag the mouse until you're happy with the angle of the cube.

11 With the cube in place, we can move on to positioning the camera. Before we do this though, select 'Add Axis' from the pull-down menus, to create an invisible axis in the centre of the cube which will be used as a focus point for the camera.

Next, the camera itself. Some ray tracing programs insist that you create this yourself, but *Imagine* does the job for us automatically. In the tri-view displays, the camera appears as a small circle with a line point out of it. At the moment, the camera is far too close to the object, so we need to move it away so that the entire object is in view. Select 'Zoom out' and then move the camera away. Now we need to align the camera so that it points at the cube using the '(Re)track camera' option. When the requester appears, enter 'Axis' and click 'OK'. To view the scene through the camera, Imagine provides a very handy 'Camera View' option in its pull-down menus that draws the perspective view as it would appear from the camera's location. If the whole of the object still isn't in view, keep repositioning and then retracking the camera until it is.

13 Although our scene looks great in wireframe mode, it wouldn't look very impressive once rendered because we haven't created any light sources. In this particular case, we're going to create two light sources using the 'Add Light Source' option which you'll find in Imagine's pull-down menus. Add each light source in turn and position them both so that they are quite high in the sky. Position the first so that its light illuminates the front of the object and the second to illuminate the side. Once this is done, save the scene off to disk.

14 With our scene complete, all that remains is to add the sky and edit the intensity and colour of the light sources, using the Action Editor. For the sky, click on 'Globals->Actor' and edit the Horizon R, G and B values so that they read 255, 255, 100 respectively. This should give you a nice sky blue colour.

Next, we need to edit the colour and intensity of both light sources. Click on 'LightSource->Actor' (or LightSource.1->Actor for the second light source) and edit the intensity of both so that the read 300, 300, 300 and 300, 50, 300 respectively. Once this is done, select 'Save Changes' and you're ready to start ray tracing...

15/16 The scene is complete, but we need to check that it 'works'. We can save it off to disk and then enter the Project Editor. It's no good jumping straight in to the ray tracing process when we can't be totally sure that the light source produces a well lit scene that is easily recognisable. Thankfully *Imagine 2* offers a very fast 'Shaded Colour' option which can be used to preview the scene before commiting ourselves to a full trace. This particular image too just five minutes to render. And, as you can see, even this preview looks pretty impressive.

If this preview image had been too dark, we would then have to either go back into the Stage Editor and adjust the position of light sources or increase intensity using the Action Editor. it's wise to render a preview image again just to be sure that our adjustments have remedied any problems spotted in the first preview image. Don't worry if it takes a few preview renders – it's better to waste 30 minutes adjusting and then re-rendering than to waste six hours waiting for *Imagine* to ray trace a scene that doesn't work too well.

17 Six hours later, here's the product of our efforts in all its 24-bit glory! Although it's still not perfect, it's most certainly getting there. If I had time, I would like to have been able to make further adjustments As it is, you'd never know that a purple light is being shone onto the scene from the east. Perhaps I could animate the scene too by rotating the object Oh well, perhaps I'll leave these rather minor adjustments to you...

JARGON BUSTING • JARGON BUSTING

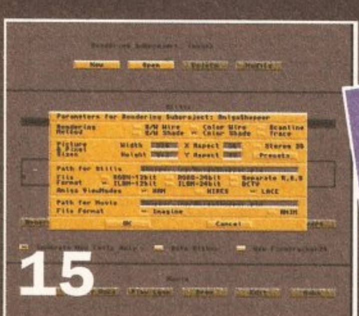
Camera – The camera position dictates where in 3D space the image is to be generated from.

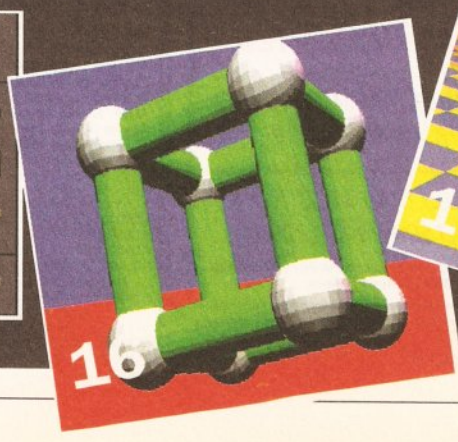
Location (Target) – Just like in real life, the camera must be pointed in the direction of the objects that you're trying to 'photograph'. In some ray tracing programs, the target is a transparent object which is completely separate from the 'real' objects – it can therefore be moved around and positioned like any other object. In Imagine 2 though, the camera can be targetted by aligning it with a particular object.

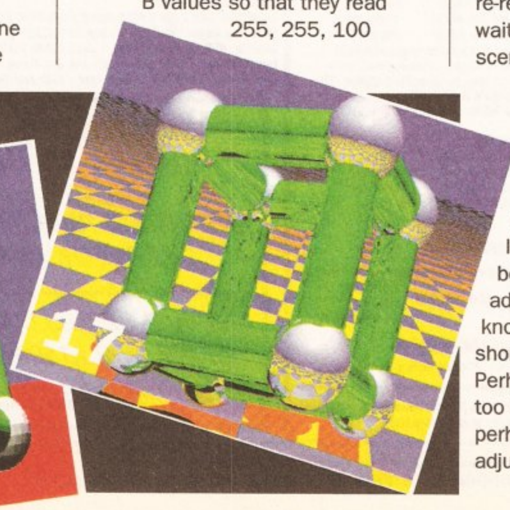
Brush Mapping – Brush mapping is a technique which is used to 'wrap' any IFF picture around an object.

Texture Mapping – Texture mapping is very similar to brush wrapping but for one major difference. Instead of wrapping a pixel-based image around an object, texture mapping uses textures that are handled internally as complex mathematical formulae.

Bump Mapping – Bump mapping can be used to create uneven surfaces on an object based around the colour content of an IFF brush. When a particular colour is found within the brush file, the ray tracing package produces a 'raised' effect that gives the object an uneven texture.







The 3D

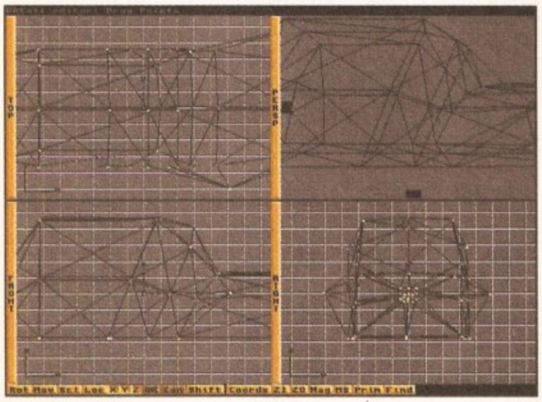
***Jason Holborn** surveys the options available to the would-be ray tracing fanatic*

Considering the Amiga's talents in the ray tracing field, it comes as a surprise that there's little in the way of ray tracing programs available. What is available though, is top-notch and on par (if not better) than similar programs on other systems. For professional work though, two programs rule the roost – Impulse's *Imagine 2* and Activa's *Real 3D*.

IMAGINE 2

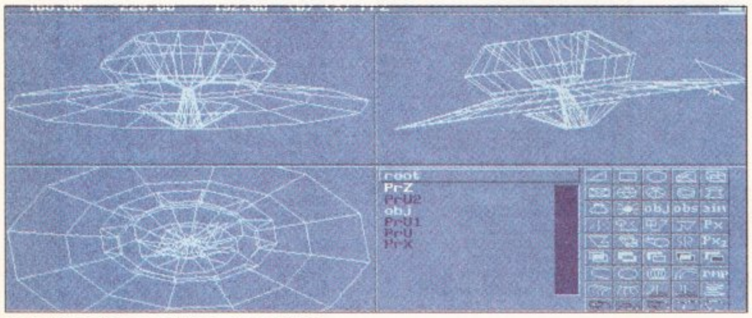
Alongside Eric Graham's infamous (and now geriatric) *Sculpt* series of ray tracing programs, Impulse were one of the first companies to produce a ray tracing product for the Amiga in the shape of *Turbo Silver*, a very powerful but flaky system that was a real pig to use. Thankfully they've moved on from those early days and their latest ray trace offering is *Imagine 2*, a powerful system that takes the good bits from *Turbo Silver* and dumps the rest in favour of a far friendlier working environment.

Imagine consists of modules used to construct and then render 3D scenes – The detail editor, forms editor, stage editor, action editor and project editor. The Detail and Forms editors are used to construct individual objects which are then pulled together into a scene using the Stage Editor. Individual attributes can then be modified and added and animations created using the very powerful Action Editor. Finally, the scene or animation is rendered using the Project Editor.



Imagine 2.0 is an absolutely brilliant program that is both logical to use and very powerful

Imagine's object, form and stage editors use the now-familiar Tri-view editing system which was pioneered by *Sculpt 3D*. The screen is split into four views – three plan and one perspective which attempts to give you an idea of what the object or scene looks like in true 3D. One nice feature is the ability to select any one of these views so that it fills the entire screen, giving you the ability to edit objects with greater precision. The range of object editing tools is comprehensive, offering all the functions you'd expect to find such as object scaling, rotation and extrusion, plus a few extras.



In terms of ease of use, no other Amiga ray tracing program comes close. It's a shame the wireframe representations are so basic

Imagine includes direct support for a vast array of screen and rendering modes. Screen mode support extends to full 24-bit and rendering modes include wireframe, shaded, scanline (same as ray traced, minus the shadows and reflections) and finally full 24-bit at virtually unlimited user-definable resolutions. It also supports many file formats, including RGBN-12 and

HIGH POWERED

While it's quite possible to get some very good results indeed using nothing more than a 1 Mbyte Amiga A600, ray tracing programs really come into their own when used on an expanded machine. If, after a couple of months, you decide that ray tracing really is your (shiny bump-mapped) cup of tea, you may well want to invest in a few extra items of hardware which can help to enhance your ray tracing sessions immeasureably. Here's a rundown of the sort of kit that you should consider if you want to render some serious scenes.

MEMORY – Complex scenes which contain objects made up of hundreds (or possibly even thousands) of points eat memory like there's no tomorrow. You should therefore seriously consider at least 3 Mbytes of RAM if memory is a little short. Whilst this won't actually speed up the process at all, it will give the ray tracing program far more room to stretch its modelling muscles. Take it from me, there's nothing more annoying than leaving your machine to render a scene only to find that it has run out of memory three hours into the render process.

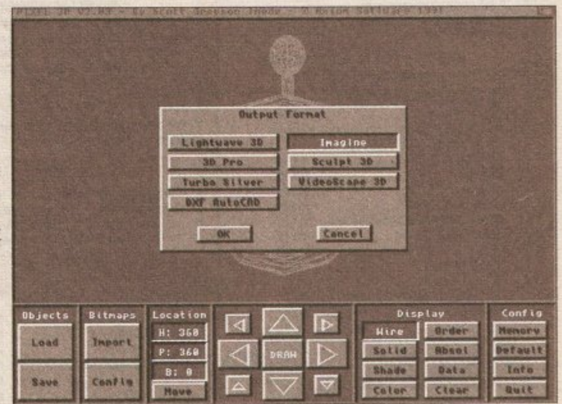
HARD DRIVE – For normal HAM work, a hard drive isn't really that necessary since even the most

RAY TRACING COMPANIONS

Quite a few companion products are available which are designed to make ray tracing faster and more productive. Here's a roundup of my current faves.

***Art Department Pro 2.1* –** ASDG's award winning 24-bit image processing program is just the thing for modifying 24-bit ray traced images in their native display configurations. *ADPro* allows you to modify the palette of the image, convert the image to a variety of different file formats, print the image on a standard Preferences printer at full 24-bit resolution and carry out many impressive image processing task. JPEG support is also very handy as it will allow you to compress massive 24-bit files amounting to megabytes in size so that they will fit onto a single Amiga floppy.

***Pixel 3D 2.0* –** If your image creation skills are a little rusty, then let *Pixel 3D 2.0* do all the work for you. It's a very clever program which can convert a pixel image from a standard IFF paint package into a 3D object. Once converted, you can then extrude, twist and spin the object to your heart's content. A little known feature of *Pixel 3D* is that it can also be used as an object converter allowing you to convert object files between a number of different packages including *Imagine, VideoScape, LightWave* and *Sculpt 4D.*



Pixel 3D can not only convert pixel images to 3D objects, but it can also be used to convert object files between a number of different file formats.

RAY TRACING

complex HAM images will happily squeeze onto a floppy disk with plenty of room to spare. If you start to work with either ray traced animations or 24-bit images though, a hard disk is virtually a must. Not only that, but a hard drive gives you far more flexibility, giving you the chance to build up huge libraries of textures, brushes and objects, all of which can be pulled in within a matter of seconds.

PROCESSOR CARD – Ray tracing takes time, no doubt about it. Although a standard 68000-based Amiga is a pretty swift little beast, ray tracing a complex scene can stretch to several hours (or even days!). Whilst this is not too much of a problem if you're generating single frames, try to generate an animation on a non-accelerated machine and you'll grow old waiting for all the frames to be completed. If the software that you use supports a maths co-processor, then this is another damned good reason for upgrading – a ray tracing program written specifically to address a maths co-processor will be considerably faster than a program which forces the processor to carry out all those complicated computations.

DISPLAY CARD – Ray traced HAM images look great, but nothing can match the quality of a good 24-bit display card. These devices will allow you to display your ray traced images in all their 24-bit glory. The price of 24-bit cards is dropping faster than share prices these days, so shop around for the best deal. The cheapest we've seen is the new OpalVision card. It offers full a 24-bit display on a standard Amiga monitor and is well worth its £800 asking price.

For those of you with somewhat humbler budgets, Digital Creations' DCTV is worth considering. Not only will it display 24-bit images, but it also includes a very impressive frame grabber. Note that DCTV is not RGB though – instead, it uses a very clever system which outputs a pseudo-24 bit image as a composite signal. While the image quality is very good, it's still not as sharp as a dedicated RGB 24-bit card.

Contenders

24-bit (Impulse's own proprietry file format), ILBM-12 and 24-bit, DCTV and separate R, G and B files.

The speed and quality of *Imagine's* rendering engine is very high indeed. Ray-traced images are sharp and full of detail. Although the object and form editors take some getting used to and animation is a little quirky, *Imagine 2.0* is a superb program worth serious consideration.

RAY TRACING ON A TIGHT BUDGET

If your budget won't stretch to the price of either *Imagine* or *Real 3D*, check out *Expert 4D Junior* from GeniSoft. Technically not a full-blown ray tracing program, it is capable of producing some well rendered images complete with subtle light source shading. It also has an easy-to-use object editor. As an introduction to ray tracing, Expert *4D Junior* is worth investigating. It costs just £49.95 and is available from GeniSoft on ☎ 0753 686000.

REAL 3D 1.4

Activa's *Real 3D* is a young upstart – although it hasn't been available as long as programs such as *Imagine's* forerunner *Turbo Silver,* it's caused a stir among those in the know. Indeed, our cover image was created using this very program running on an Amiga 2000.

Unlike *Imagine 2.0,* Real 3D is so easy to use that you barely need to consult the manual to produce some very impressive results. *Real 3D* uses the same modular approach to object design – there's a tri-view object editor used to construct objects and scenes, a wireframe editor for modifying the camera viewpoint and a solid editor which does the hard bit of converting the wireframe scenes into ray-traced images.

The most impressive aspect of *Real 3D* has to be its object editor. Creating objects in *Real 3D* is different from the more conventional skin-based method. Instead, *Real 3D* uses a technique whereby the primitives you create are real solid 3D objects rather than simply hollow skins. It offers a bewildering array of preset primitives including spheres, pyramids, cuboids and prisms, which can be further modified with ease using *Real 3D's* excellent hierarchical editing system. Using Boolean operations, you can even use one object to cut hollows into a solid 3D object.

Object attributes are well handled in *Real 3D.* As well as the usual texture and brush mapping, *Real 3D* also offers Bump mapping, a unique feature. Bump mapping allows you to assign complex textures to any object by drawing a small portion of it in a conventional 2D *Paint* package. The program then raises certain areas of the image based around the image's 'red level' for interesting results.

One nice feature of *Real 3D's* rendering page is that (providing you're in a standard Amiga screen mode) it actually shows you the scene being rendered, giving you a better idea of progress. Like *Imagine, Real 3D* fully supports 24-bit rendering of bitmaps of over 32,000 pixels square.

There's no doubt the *Real 3D* object editor beats Imagine's hands down. It's a shame its wireframe representations aren't as detailed as *Imagine's.* But apart from this there's little to separate the two. It's up to you to choose... AS

THANKS • THANKS • THANKS • THANKS

A big thankyou must go to both Henri and Yuri at Alternative Image for the excellent 'Interior' ray-traced image which proudly adorns our front cover. This image was created on an '030-based Amiga 2000 running Real 3D Pro version 1.4.2. The massive 1024 by 1024 24-bit bitmap took two days to render and filled up almost 2.5 Mbytes of hard disk space.

SHOPPING LIST

Imagine 2 .... **£269**
Real 3D Beginners **£115**
Real 3D Professional **£280**

Imagine 2 is available from Digital Multimedia Ltd at: Crest House, 102-104 Church Road, Teddington Middlesex
☎ 0702 206165

Real 3D is available from:
Alternative Image,
6 Lothair Road,
Aylstone, Leics, LE2 7BQ
☎ 0533 440041

CHECKOUT IMAGINE 2

Ease of Use ●●●○○
Getting used to *Imagine* takes time, but once you've got the experience under your belt, you'll find it a very straightforward program.

Speed ●●●●○
Imagine is one of the fastest ray tracers available!

Facilities ●●●●○
Object creation is a slow and painstaking task, but the range of editing tools is impressive.

Documentation ●●●●○
Very readable – it's just a shame that the manual is perfect bound.

Price Value ●●●○○
£270 is a lot of dough, but then *Imagine* is worth it.

Overall rating ●●●●○

Polished until it shines, Imagine 2 is a damned impressive piece of software.

CHECKOUT REAL 3D 1.4

Ease of Use ●●●●●
Object creation is absolute child's play.

Speed ●●●●○
Rendering speeds are faster for solid objects, but transparent objects slow rendering down tremendously.

Facilities ●●●●○
Unmatched by any other ray tracing program, *Real 3D* is a real work horse of a program.

Documentation ●●○○○
Not the best manual in the world, but it gets the job done.

Price Value ●●●○○
Slightly more expensive than *Imagine,* but equally worth every penny.

Overall rating ●●●●○

For ease of use alone, *Real 3D* scores very highly.

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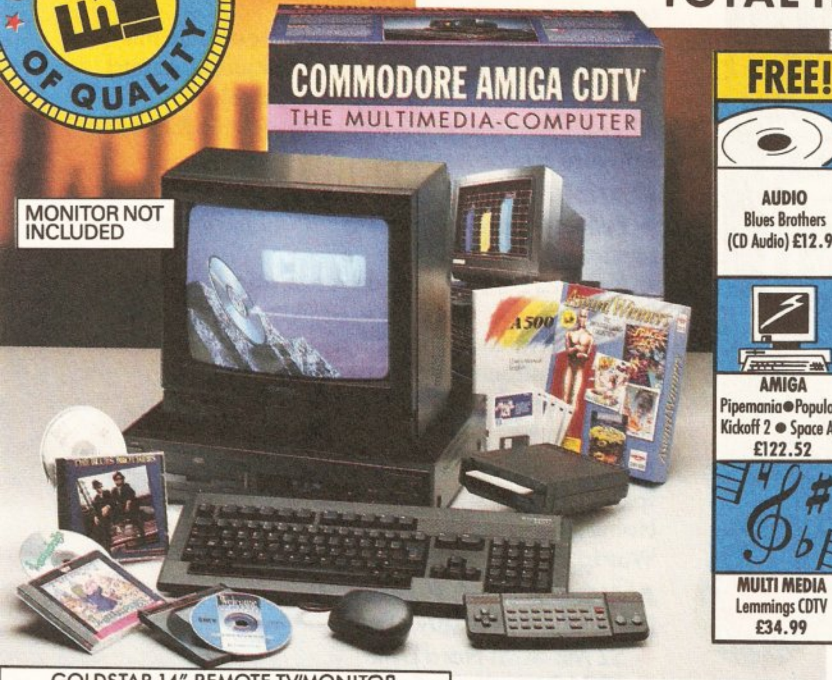
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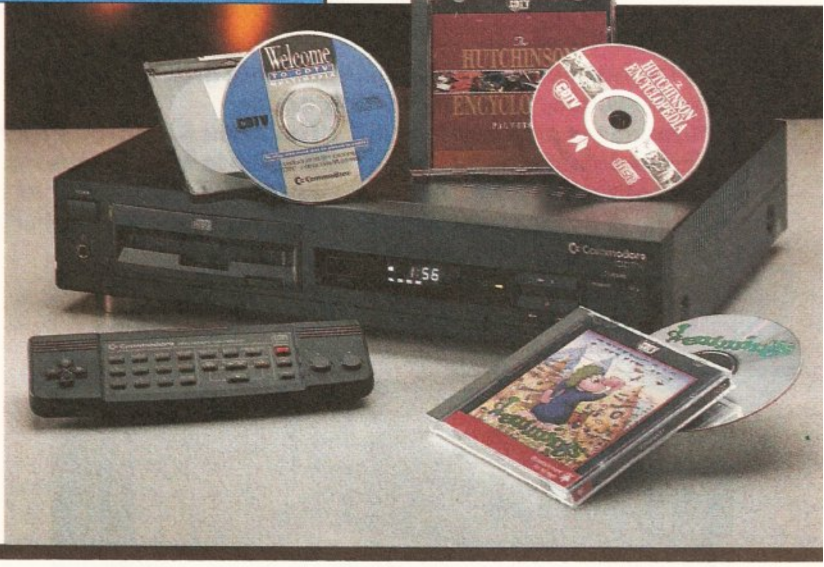
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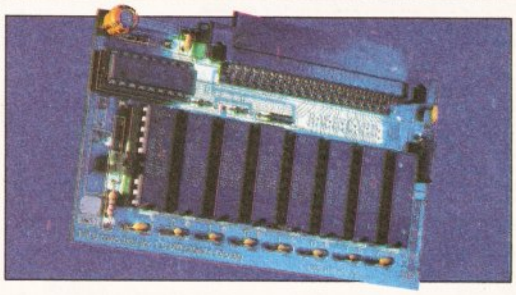
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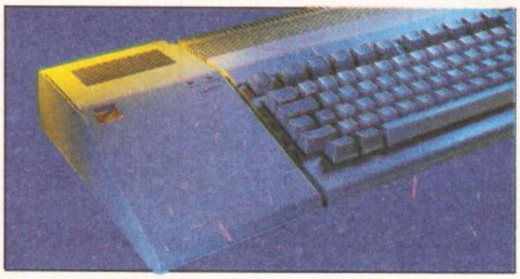
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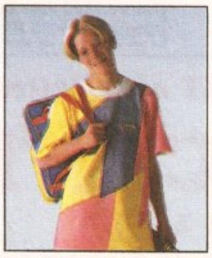
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ACCELERATORS

Toby Simpson gives you the low-down on increasing the performance of your machine

Other than a hard disk, it is likely that an accelerator card for your Amiga is going to be your most expensive hardware add-on. A few years back, buying an accelerator was easy – your choice was limited, and they were all seriously expensive. Unfortunately the decision is less than simple now. The range is vast, with lots of manufacturers making cards with lots of processor types on them.

The intention here is to try and help you decide which is the best choice for the applications you are going to be running with it. Someone who uses *Vista* and 3D modelling programs regularly is going to have different needs than someone who uses their Amiga for more generalised tasks such as word processing, accounting and comms.

MAKING THE CHOICE

Ok, so you're thinking of buying an accelerator. Now think again. Why exactly are you thinking of doing this?

Most people who will buy accelerators are after a general overall speed increase in the day to day functions of their Amiga. The more specialised groups of users are software developers and graphics artists. Each of these three groups would have different requirements from an accelerator card.

Cost, of course, is a serious factor in the available choice. If you have less than £150 to spend, its probably best not to bother. The best value accelerator you can get for this sort of money costs around £12 and is a drop in replacement for the 68000 chip: a 68010. This will give a very small but noticiable speed increase. The modification should be done by a qualified dealer otherwise you could both invalidate your warrenty and cause expensive damage to your Amiga.

If you are an A3000 owner then you can only use cards specifically designed for it. These are all currently 68040 based. The range and value for money of these cards is getting better by the day, so its worth shopping around as prices are always coming down.

For those of us who are starting from scratch, with a 7.14Mhz 68000, then a much wider choice exists. The market does *not* cater for the A600 yet, although someone will figure out how to attach a processor add-on pretty soon. For A500, A500 Plus, A1500 and A2000 owners, the range is dazzling. Ask yourself the following questions before making your choice:

- **Do I already have a hard disk?**
Some cards have hard disks on board with special high-speed interfaces. The GVP range is worth a mention for this; the G-Force cards have extremely quick SCSI interfaces. The one we tested managed about 2Mb per second peak performance using a disk speed program, whereas a standard A3000 peaked at 1.4Mb/s.

If you are getting an accelerator card for general use, then you might like to think twice and look at hard drive costs; as a hard drive will revolutionise your day to day Amiga work, such as Workbench usage, word processing, painting and so on, whereas an accelerator will make you smile and things will work a lot faster.

An ideal solution if you have niether a hard disk nor an accelerator already is to kill two birds with one stone by buying one of the dual cards.

BEGINNERS **BEGINNERS START HERE** **BEGINNERS**

What is a Processor anyway?

The MicroProcessor Unit's (Or MPU) sole task in life is to execute a sequence of very simple instructions from when its switched on till you switch it off. In order to turn this MPU into a full blown computer it needs lots of support devices, such as memory, and other special chips to allow it to have a screen display, and interfaces to the outside world. It is also referred to as CPU (Central Processing Unit.)

What is in the Amiga? And just how fast is it really?

Your Amiga has a Motorola 68000 chip in it running at a clock speed of 7.14Mega Hertz. It executes well over half a million single instructions per second. A processor that can perform 1 million instructions per second is said to be able to run at 1 MIP (Millions of Instructions Per second.) The American definition of a SuperComputer was 100 MIPS. An A4000 can deliver 20 MIPS. Your Amiga can already out-run the computers that landed men on the moon by a vast factor.

An MPU will have a clock speed which dictates how fast it can go. This is not a clock as in time, date and so forth, but a single logic signal that switches on and off rapidly. The frequency of this logic signal is the clock speed of the MPU. Each full transition from logic OFF to logic ON is called a cycle. RISC (Reduced Instruction Set Computer) processors can execute one instruction per cycle. The 68000 chip takes several cycles to execute each instruction, so at 7.14 Millions of Cycles/Second it manages less than one million instructions per second. The 68040 chip, however, is much more advanced and on average takes 1.2 cycles to execute each instruction, so at 7.14Mhz the 68040 would do around 6.5 MIPS. In reality you cannot get a 68040 to run this slowly; they start at 25Mhz, and at this speed can do about 20 MIPS. More advanced chip technologies have allowed chip designers to run chips at these high clock speeds.

Although chips are becoming very fast, memory has been finding it hard to keep up, and the bottleneck in some modern computers is not the MPU, but how fast main memory can operate. It was getting to the point that the processor would have to sit idle waiting for the memory to come up with the results. These forced delays are called "wait states". In order to alieviate this problem, the chip designers developed the cache.

What is a cache?

A cache is a small amount of extremely fast memory that is on-board the MPU chip itself. The MPU is able to read and write information to the cache much faster than main memory. The MPU is able to fetch one instruction whilst it is still executing the previous one. Because the last few instructions are held in the cache, it is possible for small program loops to execute entirely in the cache, thus running very quickly. On chips like the 68030, the Cache controllers pre-fetch both instructions and data. So, why isn't all your memory cache memory if its so fast? Well, the faster the memory the more expensive it is. Cache RAM is very expensive.

• Do I need an FPU?
The FPU (Floating Point Unit) is a hardware goodie that bolts on to the CPU to give extremely fast processing of floating point maths. What exactly uses floating point maths? Well, if you are a user of programs such as *Real 3D*, *Imagine*, *Vista*, *Sculpt 4D* and *Art Department Pro*, then you are someone who could really make use of the FPU. Desktop publishers will also benefit from an FPU. To give you an example, an Amiga A2000 with a Commodore 2630 68030 @ 25Mhz accelerator card draws our *Vista* test in 886 Seconds. With the FPU enabled, the same frame took 462 seconds to generate. There are two FPUs: the 68881 and the 68882. The 68882 came out to accompany the 68030 primarily. Most 68020 boards ship with the 68881, if an FPU is included.

• Do I need an MMU?
The MMU (Memory Management Unit) is a clever little device that converts logical addresses to physical addresses using special translation tables. Usually memory is divided up into pages and these pages could either be stored in real memory (physical RAM chips) or virtual memory (hard disk for example). The CPU is then "tricked" by the MMU into thinking that virtual memory is real memory. What happens is a program has a logical address of a memory location. This is fed into the MMU which translates it to a physical location, or causes an exception to allow virtual memory processors to act.

Virtual memory increases the amount of free RAM you have by setting aside part of your hard disk and pretending it is real RAM. It is considerably slower of course than real RAM. PC's running *Windows* use large quantities of virtual memory. MMUs also offer memory protection. Memory protection allows the CPU in a multi-tasking environment to stop one task meddling with other tasks when it goes wrong. The MMU does this by preventing tasks from writing to memory that they do not own. The Amiga currently supports neither memory protection nor virtual memory, so you might ask, "What is the point of having the MMU?"

If you are a programmer, or are thinking of taking up programming seriously, especially in C or assembly language then the MMU allows you to run some pretty neat debugging tools, such as Commodore's *Enforcer*. *Enforcer* jumps in when your program screws up and tells you what it did and where it went wrong. This is called an "Enforcer hit". It's a form of hardware debugging, and believe me, if you are thinking of purchasing that new C compiler, or looking enviously at *DevPac 3*, then you ought to be drooling over the possibility of having the MMU.

• Do I need 32-bit RAM? What is it?
The 68020 and above are 32-bit processors. This means that they can retrieve 32-bits of data at once from memory. This is equivalent to four bytes. The 68000 and 68010 chips, on the other hand, are both 16-bit processors. They can only access 16 bits, or two bytes, at once. Consequently, the A500, A600, A1000, A1500 and A2000 all have 16-bit RAM. Normally, if you simply expand the RAM of your Amiga you would be buying 16-bit RAM. If you then later on add an accelerator card then you will have a CPU that is capable of accessing memory 32-bits at a time, at least twice as fast as your old processor. So it follows that if you could add some 32-bit RAM to your Amiga with your 68020, '30 or '40 then you will have a seriously fast computer.

Most accelerator cards allow you to add 32-bit RAM to them these days. It's certainly worth checking if you expect to increase the memory of your machine at some point in the future, because 32-bit RAM will be the only way to get the best performance from your accelerator. You *cannot* convert existing 16-bit RAM to 32-bit. Your Chip RAM, for example, will always be 16-bit, as will any trapdoor RAM added by A500 or A600 owners.

The A4000 is a major step forward in Amiga Technology as it is 32-bit throughout - there is not a single byte of 16-bit RAM to be found in it anywhere.

THE MOTOROLA 68000 FAMILY

68000
Internally the 68000 is fully 32-bit, but externally it is a 16-bit chip. It can address a maximum linear address space of 16Mb. It was available in 4, 6, 8, 10 and 12.5Mhz versions.

68010
The 68010 is pin compatible with the 68000 chip, and it is possible to replace it directly with a 68010. If you are going to try this, get at least an 8Mhz chip. The 68010 adds virtual memory to the 68000. Other improvments over the 68000 are a small cache and improved speed of execution for some instructions.

68020
The first version of the 68000 series to be fully 32-bit, representing a major performance increase over the others. It has a 256 byte instruction cache, an expanded instruction set and new addressing modes. The 68020 was available initially at 12.5 and 16Mhz, with a performance of 2-3 MIPS. It's now available in 20 and 25Mhz versions, giving around 5 MIPS. With the 68020 came the 68881. Most '020 based accelerators will allow you to add the 68881 FPU, and also an MMU.

68030
The 68030 has a 256 byte data cache, a 256 byte instruction cache and an MMU. It can address 4Gb of memory. The 68EC030 is identical except it does not have the MMU.

68040
The flagship of the Motorola range, this chip has seperate 4K instruction and data caches, an on-board FPU and dual on board MMUs. At 25Mhz, it is capable of executing 20 MIPS. It also manages 3.5 MFLOPS with its onboard FPU. The only catch with this chip is the Floating Point Unit. Its not a full 68882. Some of the instructions that are present in the 68882 FPU, found mostly on the 68030, are not present on the 68040. The missing instructions are emulated in software.

The Future
Rumours of both a 68050 and 68060 have floated around now for some time. It would be reasonable to expect that the next 68000 series chip would be the last. It is also likely to have an improved FPU on board and increased parallelism. It's likely to be very fast indeed.

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Linear Address Space - The maximum amount of physical RAM that the MPU can see at any one given time. A processor such as the 68000 can see up to 16Mb of memory. The 68020 and above can see up to 4 Gigabytes at once.

CMOS - Complimentry Metal Oxide Semiconductor. This is a chip type. The unique thing about CMOS chips is that they require very little power to run on. Originally the disadvantage was they were extremely slow in comparision to other logic types. These days, CMOS technology has advanced considerably, and CMOS chips are now lightning fast, but still requiring a fraction of the power of other chip types. This made it possible to manufacture portable computers (and is, incidently, why we have yet to see an Amiga Portable, since the old chip set and ECS were NMOS chips. The new AGA chip-set as found in the A4000 is now CMOS; so fingers crossed...)

NMOS - Negative Oxide Metal Oxide Semiconductor. NMOS chips require much more power to run, and the individual logic gates can not be packed to densely.

BCD - Binary Coded Decimal. A method of referring to decimal numbers that is more easily dealt with by Microprocessors. This notation is not used oftern in the Amiga world. The 68020 provided new instructions to process BCD numbers.

MIPS - Millions of Instructions Per Second. This is a benchmark showing how many single machine code instructions a processor can execute in one second. A standard Amiga executes under 1MIP. An A4000 will manage around 19-20MIPS.

MFLOPS - Millions of Floating Point Instructions/Second. A benchmark, rather like MIPS, execpt it refers to floating point math instructions.

SIMMS - Single In-line Memory Modules. A rather neat way of reducing the chance that you will write off £100 worth of new RAM by mis-installing them. Memory is provided on a self contained module which plugs into a special socket on your curcuit board. The modules are vastly easier than chips to install, and as the IBM PC Compatible market has embraced them, the prices have conveniently come tumbling down!

DMA - Direct Memory Access is a process where external hardware, such as a hard disk controller is able to put data directly into the computer's main memory without the need for a program to transfer the information. It makes for very fast data manipulation. The Amiga is full of DMA-based goodies, such as the graphics and sound hardware.

THE ACCELERATORS REVIEWED AND RATED

COMMODORE A2630

Until recently this was the flagship of Commodore's accelerator range. It is a 25Mhz 68030 with MMU and 25Mhz FPU. It comes with either 2Mb or 4MBb of Fast 32-2bit RAM. There is no on board hard-disk controller, although it does have a special expansion connector for RAM or faster processors. It is an internal card for either the A1500 or the A2000 computers. It can also be used to replace the Commodore A2620 68020 card found in A2500s.

FITTING

It fits in the CPU expansion slot of the A2000, and does not take up any of the normal Zorro II expansion spaces. Fitting is a straighforward matter, although best left to a dealer if you're worried.

IN USE

This board requires no setting up. Once it's installed, that's it. It is transparent in use. A special boot-menu is provided so that you can disable the 68030 and fall back to 68000 mode. The A2630 is capable of providing UNIX on the A2000, with the correct ROMS, lots of money, large quantities of RAM and a huge hard disk you can have the joys of UNIX on your home machine.

OVERALL IMPRESSIONS

It's a pretty bland, no frills 25Mhz 68030 card; absolutely bomb proof, totally reliable. Other than the fact that the RAM is not on SIMMs and therefore cannot be easily expanded from 2MB to 4MB, there is nothing much wrong with it. There have been two in this office working faultlessly now for over a year.

One of the possible plus points for FPU users is that the card will accept a 33MHz 68882 in replacement for the existing 25Mhz one.

The card itself is a bit pricey in comparison to other 68030 cards for the A2000.

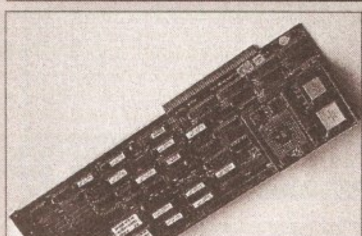
Manufactured by: Commodore Business Machines UK Ltd. ☎ 0628 770088

FEATURES TABLE

Fitting:	**Involves opening case to fit card.**	●●●●○
Software:	**None Supplied, not required.**	
Documentation:	**Excellent, straightforward manual.**	●●●●○
Minimum Hardware Requirements:	**A1500, or A2000.**	
MMU:	**Fitted.**	
FPU:	**Fitted 25Mhz, expandable to 33Mhz 68882.**	
Hard Disk Interface:	**None.**	
Price:	**£920 for 2Mb.**	

OVERALL: ●●●●○

CSA ROCKET LAUNCHER



A gadget which fits onto Commodore's A2630 card and accelerates it to a 50Mhz 68030 and 50Mhz 68882.

FITTING

The board itself is very small and fits over the top of the 68030 chip already present on the A2630. You actually have to remove the existing 68030 and 68882 chip before fitting the Rocket Launcher. Fitting can be made more difficult depending on the revision of 2630 board. This installation is probably better made by a dealer.

IN USE

As with the A2630, this requires no setting up and no software support. Once installed, you have a 50Mhz 68030 at your fingertips, running about twice as fast as the normal A2630. This is extremly fast indeed, the Amiga just whizzes along.

OVERALL IMPRESSIONS

It provides an upgrade path which will not involve selling the A2630 and as such represents a very economical option. The manual, although brief, is thorough and provides all the information you need to know. Once installed, the board is as transparent as the A2630. If you own an A2630 card you ought not to miss this.

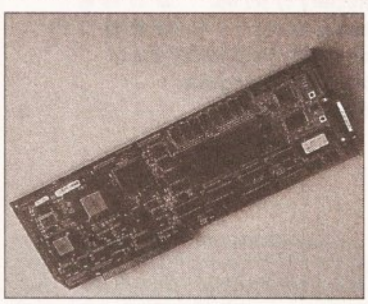
Manufactured by: CSA ☎ 0101 619 566 3911; distributed by: Omega Projects ☎ 0942 682203

FEATURES TABLE

Fitting:	**Reasonably easy.**	●●●●○
Software:	**None required.**	
Documentation:	**Brief, but good.**	●●●○○
Minimum Hardware Requirements:	**A1500, A2000 with Commodore 2630 68030 card.**	
MMU:	**Included.**	
FPU:	**Included.**	
Hard Disk Interface:	**None.**	
Price:	**£549.**	

OVERALL: ●●●●●

GVP G FORCE CARDS



This is a 68030 card for the A2000, available in either 25, 40 or 50Mhz configrations. The 40 and 50MHz versions reviewed come with 4Mb of Fast RAM. All versions come with a hi-speed SCSI interface. The hard disk can actually be fitted to the card itself if the correct bracket is purchased. The boards accept up to 16MB of RAM, except for the 25MHz version, which takes up to 13Mb.

FITTING

Like the A2630 card, it fits in the special CPU expansion slot.

IN USE

The 40Mhz version does not have an MMU, but both reviewed cards came with a 68882 FPU running at the same clock speed as the 68030.

With the optional hard disk, fitted to the 40Mhz version of the card reviewed, the user has a full DMA SCSI controller which performs much faster than the IDE drive found in the A4000.

OVERALL IMPRESSIONS

This really is the A2000 version of the A530 reviewed below. It's a good value for money product. The software supplied is comprehensive and excellent, although the hard disk prep software might be a bit intimidating for new users.

Manufactured by: Great Valley Products ☎ 0101 215 337 8770 Distributed by: Silica Systems ☎ 081 309 1111

FEATURES TABLE

Fitting:	**Involves opening case.**	
Software:	**Excellent.**	●●●●○
Documentation:	**Excellent.**	●●●●○
Minimum Hardware Requirements:	**A1500 or A2000.**	
MMU:	**Depends on Model.**	
FPU:	**Optional.**	
Hard Disk Interface:	**Fast DMA based SCSI controller on board. Hard disk available optionally.**	
Price:	**40Mhz, as reviewed: £849. 50Mhz, as reviewed: £119.**	

OVERALL: ●●●●○

COMMODORE 68040 CARD

This card first appeared in a special version of the A3000T available in the USA, and is now found in A4000s. It is a straight forward 68040 card clocked at 25Mhz. As with all 68040s, the MMU and FPU are on board the chip itself. This board is currently not available for existing A3000 owners.

FITTING

Easy. A3000 owners will need KickStart 2.04 on ROM in order to use this (or any for that matter) 68040 card. Due to bugs in the original A3000 boot ROMs, 68040 cards will not run straight off. Accelerators for the A3000 plug into the special CPU expansion port, which is different to that of the A2000 to reflect the 32-bit bus which is found on the A3000 and A4000 computers.

IN USE

Transparent. The card is very fast in most operations, although some of the floating point tests we carried out didn't show a significant increase in speed as some FPU instructions are not present on the 68040 chip and need to be emulated in software.

OVERALL IMPRESSION

Solid, well-behaved card. Some software is needed, including the Commodores 68040.library in order to patch the OS.

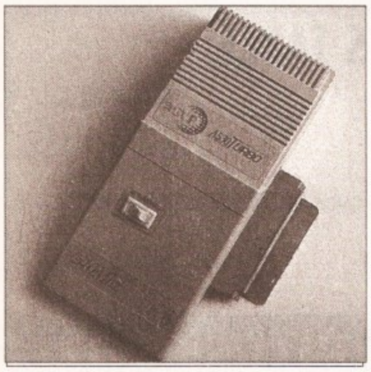
Manufactured by: Commodore Business Machines UK Ltd. ☎ 0628 770088

FEATURES TABLE

Fitting:	Fits in the CPU Expansion slot inside the A3000/A4000.
Software:	Little needed.
Documentation:	Adequate.
Minimum Hardware Requirements:	A3000 or A4000.
MMU:	Internal to '040.
FPU:	Internal to '040.
Hard Disk Interface:	- none -
Price:	NA

OVERALL: ●●●●●

GVP A530



The A530 is a combination high-speed SCSI hard disk and 40Mhz 68030 accelerator for A500 owners, fitting where a A590 would go. It is available with an optional 68882 FPU. The version reviewed came with 1MB of 32-bit RAM. It will accept up to 8MB.

FITTING

Couldn't be simpler. The manual wasn't really necessary.

It auto-boots from the hard disk, detects which version of KickStart you have and asks you if you want to install the appropriate WorkBench version.

IN USE

Great. I got straight into it – the installation is self explanitory. The software and documentation supplied is excellent.

The A530 comes with a SCSI connector on the back, so it is easy to add further SCSI devices at a later date. This device also accepts GVP's 286 PC Emulator card.

A handy switch is provided on the front of the A530 to disable it, allowing you to run software that does not like the 68030.

The disk which comes with the package contains a useful collection of utilities to control various features of the A530, such as disabling the 68030, or mapping the Kickstart ROM into 32-bit RAM for example.

OVERALL IMPRESSION.

An excellent product. If you are an A500 owner and are seriously thinking of adding a hard disk or an accelerator, or both, go and have a good long look at this device, and take your credit card with you. You may not want to leave it!

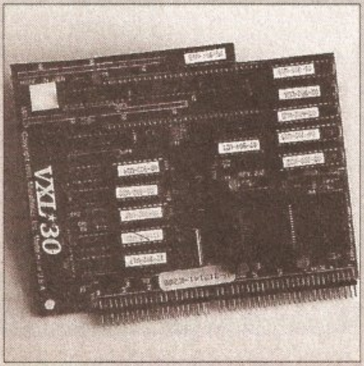
Manufactured by: Great Valley Products ☎ 0101 215 337 8770
Distributed by: Silica Systems ☎081 309 1111

FEATURES TABLE

Fitting:	Very Easy.	●●●●●
Software:	Comprehensive.	●●●●○
Documentation:	2 Manuals, one for GVP's Hard Disk software, one especially for the A530.	●●●●●
Minimum Hardware Requirements:	A500 or A500 Plus, with at least KickStart 1.3.	
MMU:	No.	
FPU:	Optional.	
Hard Disk Interface:	Yes, High Speed GVP SCSI with internal Drive (120MB) and external connector.	
Price:	£799.00.	

OVERALL: ●●●●●

MICROBOTICS VXL-30



This is another internally fitting A500/A2000 card. Microbotics does several versions of this card, and the one reviewed was labeled as a 25Mhz 68EC030 – the EC meaning no MMU – although actually it turned out to have the MMU fitted. No FPU was present, although it can be added as an optional extra. RAM is available as a seperate plug in module for this. Our review model had a 2Mb RAM module with it.

FITTING

Well, this is pretty much a pain, and you should really get a dealer to perform this operation for you, otherwise you'll age 30 years and have kittens in the process of adding it. People who have added Gary Towers (1.5MB trapdoor expansions which plug onto the Gary chip in some way) will have problems fitting the RAM module. Finally one of the plastic support legs on it was up the wrong way and stopped us from fitting the keyboard back without removing it and fitting it ourselves.

IN USE

It seemed fine, with some software enclosed to allow software switching of the 68030 and 68000. The program *SetVXL* allows the cache options to be turned on and off also.

FEATURES TABLE

Fitting:	Slightly easier than the CSA board.	●○○○○
Software:	Excellent, and not necessary to set up.	●●●●○
Documentation:	Small, but comprehensive.	●●●○○
Minimum Hardware Requirements:	A500, or A2000. Kickstart 2 recommended due to some bugs in 1.3 causing timing problems.	
MMU:	Included. Depends on model.	
FPU:	Optional.	
Hard Disk Interface:	- none -	
Price:	£274.99.	
RAM Module:	£199.95.	

OVERALL: ●●●●●

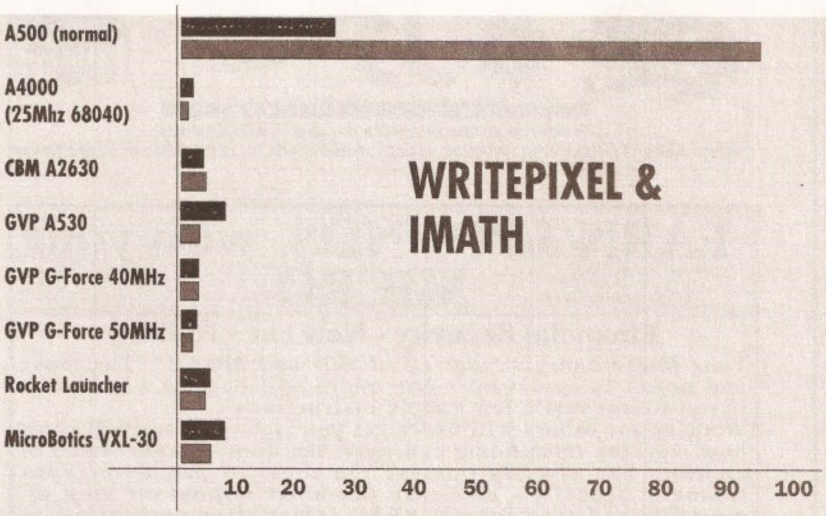
OVERALL IMPRESSION

A good product, but tough to install.

Manufacturers by: MicroBotics Inc. ☎ 0101 214 437 5330
Distributed by: Micro-PACE UK Ltd. ☎ 0753 551 888

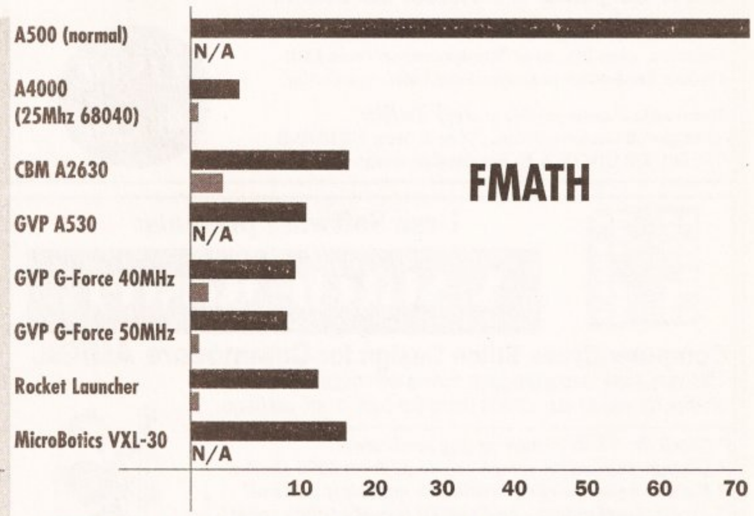
ACCELERATORS SPEED COMPARISONS

The graphs below show how each of the accelerators perform in a series of speed tests. The final graph gives an overall rating



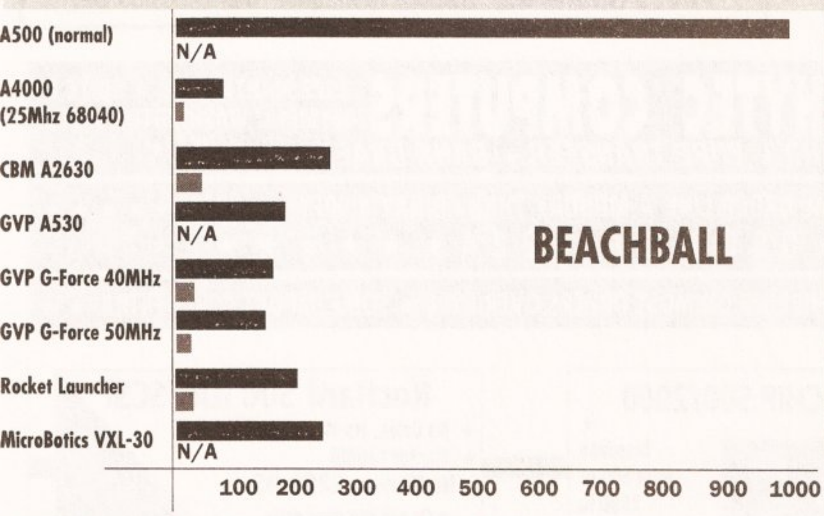
WritePixel – a screen based benchtest that tests how fast pixels can be drawn to the screen. A quick (small) time indicates rapid screen displays, window movement and scrolling

IMath – Integer Mathematics. A quick (small) time in this indicates rapid Integer Maths, which will indicate an overall speed increase thoughout the Amiga in all operations



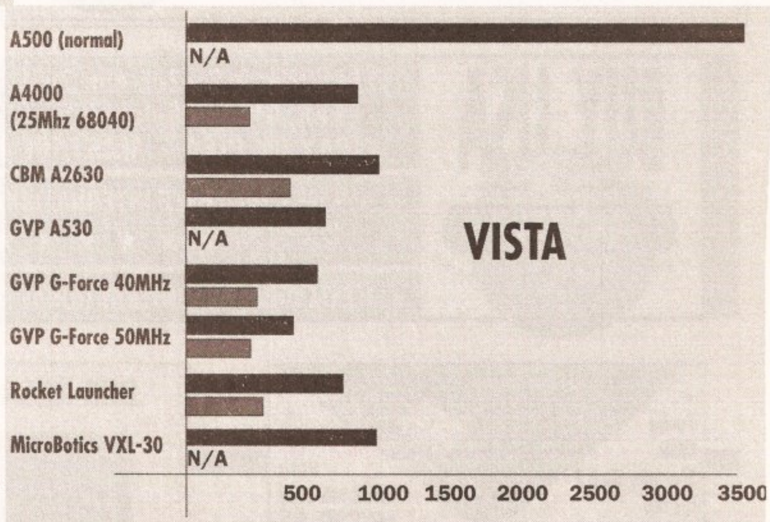
FMath – Floating Point Maths. A good time in this means programs such as DTP and graphics applications will work faster

The same times but with the FPU installed if applicable



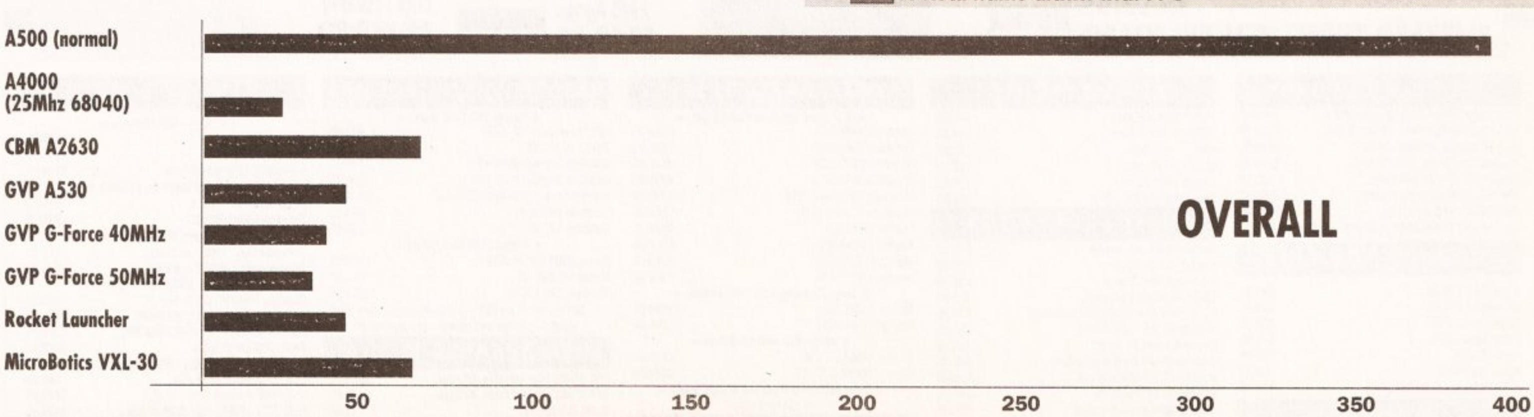
The time taken to draw a ray traced beach-ball

The same drawing but where applicable the FPU timings are shown



A vista frame drawn without the FPU

A vista frame drawn with FPU



An average timing showing how fast the cards are in comparison to each other

The SHAPE of things to come

Put a little structure into your drawings with Professional Draw 3.0 – Jeff Walker draws on the wealth of possibilities offered by this latest release...

Professional Draw 3 is the latest version of Gold Disk's structured drawing package. It's been a long time coming; version 2 was released way before _Amiga Shopper_ was born, and rather than review an 'old' program I've been waiting impatiently for version 3. Impatiently, because Gold Disk first told me the 'specs' for version 3 more than a year ago.

A 'hotlink' to *Professional Page 3* was promised. Adobe Type 1 typeface support was hinted at. And 24-bit support, gradient fills, plus a magical feature called Genies, which sounded pretty neat and, as *ProPage 3* owners know, turned out to be the wonderful interactive ARexx scripts. It all happened just as Gold Disk said it would. We'll talk about these new features later. Best we start at the beginning though.

Structured drawings are intended solely for publishing purposes, not to ogle at on the screen. Their aim in life is to print out at the highest resolution your printer is capable of, be it a 9-pin dot-matrix or a high resolution image-setter. Structured drawings are the illustration equivalent of 'outline' typefaces. And just like outline typefaces they can use lots of memory and take a while to render on the screen and to the printer.

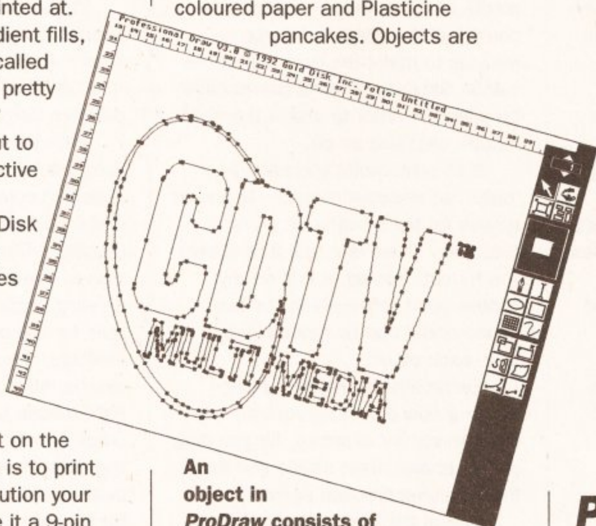
SQUIGGLY STRUCTURES

All drawings in *ProDraw* are created from single structures called 'objects'. An object is a shape – a line, a curve, a rectangle, an ellipse, and so on. All objects have 'attributes', colour and thickness for example. As a drawing progresses, two or more objects can be grouped together to form a single object. To *ProDraw*, the squiggles you have made are not a collection of coloured dots, they are a structure that is held in memory as a description.

This description is rendered on the screen at the screen's resolution, which is approximately 65-75 dots per inch (dpi) depending on what monitor you are using. Diagonal lines and curves will look jagged on the screen, but when printed, structured drawings render at the printer's resolution, which is normally a much higher 300 or 360 dpi. If you printed them on a professional imagesetter they would print at 1,270 dpi, or whatever is the resolution of the imagesetter.

Structured drawings are held in memory as a description of the image, rather than the image itself. It's left to the output device (screen, printer, imagesetter...) to draw the image from the description.

If you are used to creating pictures with a paint program, be warned, creating the same things as structured drawings will be a different ball game. It's no good sitting there complaining that "*Deluxe Paint* doesn't do it that way", you have to learn a whole new set of skills. Creating pictures with a paint program is like putting oils on canvas; structured drawing is more like using a combination of pencil, crayon, bendy-wire, sticky-back coloured paper and Plasticine pancakes. Objects are defined by 'control points'. A straight line, for example, will normally have two control points, one at each end.



An object in _ProDraw_ consists of lots of control points (the black squares) that describe the line or curve between adjacent points. The best way to work with control points is in Wireframe mode so that fill patterns and line thicknesses don't get in the way

Control points are not fixed, they can be moved around at will. Moving either of the control points of a straight line would simply change the angle of the line. But if there was a control point in the middle of the line, moving that would cause the line between the two end points to bend in the same direction as the middle control point – a bit like what would happen if you pinned a length of elastic down at each end and then lifted up the middle a little bit.

Apart from the start and end 'anchor' points of lines and open curves, each control point is connected to two other control points, one on either side of it, so moving the control point changes the description of the line that joins it to its partners. The part of the line between two control points is called a 'segment'. Once you've wrapped your head around this, the rest is just practice and experimentation.

CLIP SERVICE

Individual objects or groups of objects are saved as Clips, which is Gold Disk's own structured drawing format. These Clips can be imported by *PageStream*, *ProPage* and *PageSetter II*, but not *Saxon Publisher*, which prefers the rival IFF-DR2D structured drawing format that *ProVector* uses.

Clips can be saved individually, or you can save many of them together in one file. When such a 'library' is opened by another program you will be presented with a list of Clips and asked which one you want to import.



In black & white mode the screen refresh is much quicker and different colours can be distinguished by different dither patterns

A *ProDraw* project, which may contain many pages, is called a 'folio'. The whole folio can be saved as a single file, or each individual page may be saved separately. These files are not the same format as 'documents' and 'pages' in *ProPage* or *PageSetter II*, only the clip files are interchangeable.

The program can import (and print if required) IFF-ILBM bitmap graphics up to 24-bit standard (16.7m colours). To conserve memory bitmap graphics are displayed on-screen in a maximum of four shades of grey; in almost all circumstances this is enough colour to enable you to work with the graphic, even if it's really a 16.7 million colour one. In black-and-white mode *ProDraw* replaces these shades of grey with dithered patterns.

Encapsulated PostScript Format

(EPSF, more commonly called just EPS) may also be imported, but these can be output only to PostScript printers or to a PostScript file, and they cannot be displayed on the screen. Instead you get a shaded rectangle. This rectangle can be scaled, cropped and rotated, but that's all, and you are working blind so the feature is of limited use.



With Wireframe off the drawing can be viewed in WYSIWYG, but it takes longer to render on the screen

To display and enable you to edit and manipulate EPS files, *ProDraw* would have to include a full-blooded PostScript interpreter in order to convert the EPS format data into its own Clip format. This would add considerably to the cost of the program, and not everyone needs EPS support. Perhaps a better solution would be a separate EPS-to-Clip conversion utility. If there's a demand for it, I'm sure Gold Disk would consider developing it. So shout loud at Gold Disk if you want it, but don't expect it to take any notice of you unless you are a registered user.

The main reason people want on-screen EPS support is because there is an enormous library of PD and commercial structured clip art available, most of it created with the famous Adobe *Illustrator* program on the Macintosh. But more and more Amiga structured art is becoming available in Clip format, on the PD scene as well as commercial.

Another way to build up a large library of Clips is to use the *Trace* program that comes with *ProDraw*. This utility is able to turn IFF-ILBM bitmap graphics into structured drawings. Its main use is for converting black-and-white line art, or simple pictures that contain just a few solid colours.

Although *Trace* will do it if you insist, it is not sensible to convert 16 level grey or 32-colour bitmaps of scanned photographs, or any other bitmap that is both colourful and complicated. It will take a very long time to trace – we're talking hours and hours here – and the resultant file will be of an enormous size, probably well over a megabyte, which will take maybe an hour to load into *ProDraw* or a DTP program.

It can take a while to convert even a simple black-and-white bitmap, and the results are not always perfect. You are able to adjust a 'Fit' parameter that decides how accurately the bitmap is traced – the higher the Fit figure, the smoother the curves will be, but the less accurate the result. The *Trace* program mustn't be looked on as a perfect solution to converting bitmaps to structured drawings. It's doing a very difficult job – which is why it takes so long – and it does the best it can. It makes a fairly good job of tracing company logos, cartoony art and simple diagrams, both in black-and-white and colour.

DRAWING SKILLS

If you use *ProDraw* merely to import clip art, even if you are editing the drawings after importing them, you're only scratching the program's surface.



A traced bitmap may end up containing many thousands of control points, every single one of which you may alter the position

The common fallacy is that you have to be 'born artistic' or 'have a gift for art' to be able to draw. Poppycock! Drawing is nothing more than attention to detail and practice. If you have a desire to draw, then you can learn.

ProDraw provides you with four basic drawing tools. The Pen tool is for drawing straight lines and curves, both of which can be constrained to 45 degree angles if you like; the rectangle tools draws rectangles, which can be constrained to squares; the Ellipse tool draws ellipses, which can be constrained to circles. The Freehand tool lets you draw freehand – inexact for sure, but useful for the twiddly bits, especially at high magnification. Everything you draw will begin with shapes drawn with these four tools.

Any number of extra control points can be added to any line or segment, allowing you draw a rough approximation of the subject and then 'pull' and 'push' the shapes about until they are the correct shape, very much like moulding with clay. For instance, to draw a profile of a face you could start with an ellipse. By adding three control points at the relevant position you could pull the middle of these inwards to make the dent where the eye is. Similarly, control points can be added in order to shape the nose, mouth, chin and so on.

If at some point you need to 'open' an enclosed shape – to create a neck for the head to sit on for example – there is a tool that allows you to 'cut' through a line at any control point, after which the two 'loose ends' can be moved away from each other.

Eventually you reach a point where a new object is required – to draw an ear for example. So you drag out an approximate shape and begin the moulding process again.

One of the best ways to learn how to draw with *ProDraw* is to import a black-and white bitmap of some line art and use the drawing tools to trace over the lines by hand.

Unlike *ProPage*, which has pre-set magnification levels, *ProDraw* will let you magnify to any level. Using the mouse to drag a box over the area to be magnified you can zoom in to a maximum magnification of 800 per cent, so that the whole screen displays about a one inch square of the page. At this level of magnification the Freehand tool comes into its own for adding those little touches, a spot of reflection in the pupil of the eye for example.

DIFFERENT WORK MODES

There are various modes in which you can work. The sexiest mode is Colour with Wireframe switched off (WYSIWYG mode).

Colours are specified as RGB values of 0-15 each, allowing for the standard Amiga 4,096 colours in total, or you can use YMCK (yellow, magenta, cyan, black) percentages, giving a theoretical maximum palette of one hundred million, although only up to 65,000 colours can be defined and present in the requester at once.

New to version 3 is the database of more than 700 predefined 'Pantone' colours.

ProDraw uses dithered colours to simulate a large number of colours on-screen – about 1,000 of them. While these are by no means exactly accurate representations of the colours that will be printed, it's the best you are going to get without expensive 24-bit hardware and software. Professionals will be using known YMCK values from a colour chart anyway, so the important thing is that you can see the difference between colours on-screen.

Tints of colours can be quickly defined by entering a percentage after the name of a predefined colour – "Blue 50%" for example – the program does the rest.

With Wireframe switched off all lines will be displayed in their specified colours and thicknesses, and objects that are filled will be displayed filled with the specified colour. The more complex your drawing becomes, the longer it will take for the screen to render. As in *ProPage*, the *ProDraw* screen refresh can be interrupted by clicking the right mouse button, enabling you to crack on with work after the part of the drawing you are interested in has been rendered without having to wait for the rest of it.

MONO FOR SPEED

Toggling into Black & White mode will speed things up, colours being replaced with fill patterns composed of black and white dots. If your work is going to be printed in monochrome, this is the most sensible mode to work in.

Rendering can be speeded up even further by switching Wireframe on. In this mode no colours or line thickness are displayed, just the pixel-thin outlines of the shapes. Once you are used to the system this is by far the most productive mode to work in, switching Wireframe off, and toggling into colour every now and then to check that everything's OK.

Another new feature in version 3 is the ability to switch individual objects into Wireframe while everything else remains WYSIWYG. This gives you the best of both worlds – the ability to work in WYSIWYG mode and a faster screen refresh as you can toggle every object except the one you are working on into Wireframe, or 'Outlines' as the menu item calls it to distinguish it from actual Wireframe mode.

Remember that if Wireframe is on, colours and line thickness will not be displayed, even if you are in colour mode. To see line thicknesses and colours, Wireframe must be off. The Wireframe menu item will have a tick next to it if it is on.

Line weights can be anything from a 'hairline' – the thinnest line

any particular output device can produce – up to enormous thicknesses that are bigger than the maximum page size of 48in by 48in. There are nine styles of line to choose from – one solid and eight dashed and dotted – and you can invent your own pattern. Connected lines can join in one of four ways: mitre, round, bevel or butt.

One small disappointment is that there are no fill patterns at all. For monochrome work these can be especially useful, and it's very puzzling that Gold Disk's budget *PageSetter II* DTP program has this feature, and *ProPage* has some pre-defined fill patterns, but *ProDraw* has none. Wonder why?

SPECIAL EFFECTS

The real power of the program is in its ability to create special effects at the click of a few buttons, effects that would take hours to create by hand.

Gradient fills are new to version 3. In previous versions you could simulate this effect to a certain extent by using the Blend feature (which is still present), but now you can create those marvellous filled backgrounds that change smoothly from one colour to another, or from dark to light, much more easily.

Both radial and linear fills are supported. Radial fills are those that start off as a circle and change colours in a specified number of steps radiating out from it until the edges of the object are reached. Any shape may have a radial fill, not just a circle. The classic example is of a gradually shaded sphere with a white highlight where a bright light is reflecting off it. It simulates a kind of 3D effect. The centre of the radial fill can be placed anywhere within the object, the start and end colours can be anything you like – white to black, green to red, yellow to orange – and the number of steps can be anything from 2 to 2,000; the program calculates the colours required to blend the start colour into the end colour.

Linear fills can be tilted to any angle in 0.1 degree steps. Again the start and end colours can be any of your choosing, and the number of steps is between 2 and 2,000. But linear fills don't have centres, so you can't, for example, automatically simulate the effect of looking down on a bevelled tile by having a light shaded centre point (the peak of the tile) getting darker down the four triangular sides. This would have to be done in four steps by drawing four joined triangles that form a square and then shading each one individually.

The aforementioned Blend feature has two uses. Firstly it can be used to turn one simple object into another simple object, using a specified number of steps. The starting and ending objects may contain a different number of control points, so it's perfectly possible to turn any shape into any other shape – a straight line into a circle for example. But this doesn't work with drawings that are composed of several objects (groups or 'compound' objects), only with simple objects – single objects created with the Pen, Rectangle, Ellipse, Freehand or Grid tools.

At the same time as changing shape, the colour of the first object can be blended into the colour of the second object, in much the same way that the gradient fills work except this time it is each object in the transformation that takes on the next colour in the blend.

To help you keep everything in line there is a customisable grid that can be 'snapped' to, plus several features that allow a selected group of objects to be aligned with each other. These come in handy for centring graphics or text between the left and right hand margins on a poster, for example, or for laying objects exactly on top of each other.

A group of objects can be turned into a 'compound' object. This will be used most often to create 'holes' in existing objects.

Say you had drawn a wall of a house as a coloured rectangle, and you had also drawn a small chair that you would like to be seen through a window in this wall. One way would be to draw a white rectangle for the window and place it on the wall, then place the chair on the white rectangle. It would look like you were viewing the chair through a window. But a better way would be to draw the window on the wall, group the window and the wall together and make them a compound object. This turns the rectangle for the window into a real hole in the wall. So you can now place the wall on top of the chair, and the chair will be visible through the window.

HELPFUL TOOLS

Scaling, or resizing, objects or groups of objects can be achieved either by clicking on the Scaling tool and dragging control points, or by double clicking on the Scaling tool and entering percentage figures for X and Y directions.

A number of other tools bring up a requester when double clicked. The Null Pointer tool brings up an Object Position requester that allows an object to be positioned more accurately and more quickly than by hand. The Zoom tool brings up a Screen Scale Factor requester that will take factors from 25 per cent (0.25) to 800 per cent (8.0). These above three features are actually part of the program, the next four 'double-clickers' are actually 'Tool Genies'. I'll talk about Genies later, but for the moment it's enough to know that with a knowledge of ARexx you are able to edit these Tool Genies, or create new ones that work with the other tools.

Double clicking the Marquee tool (the one that groups objects) puts up a requester that allows you to group objects according to their attributes. For instance you could group all objects that are a certain colour, all objects that are circles, all objects that are EPS files, all objects that are of a certain size or within the bounds of specified co-ordinates... This feature helps enormously when you want to make wholesale changes to the attributes of objects.

Double clicking the Pen tool



Text handling is much improved with direct Compugraphic support and a supplied utility that will convert Adobe Type 1 to Compugraphic. Many new features allow you to set text juts the way you want them

results in a requester asking for the number of sides and the radius of the polygon you want to draw. Enter 5 and you get a pentagon, 6 for a hexagon... you get the idea.

For the Ellipse tool you are asked for width and height figures, much quicker than dragging it out by hand. For the Rectangle tool it's width and height, plus a radius parameter for drawing boxes with rounded corners.

One tool I've not mentioned yet is the Text tool. This has had major changes made to it since version 2. It now directly supports Compugraphic typefaces, plus there's indirect support for Adobe Type 1 typefaces in the form of the FontManager utility that converts these to Compugraphic.

The Supplement Manual says that *ProDraw 3.0* can use standard Workbench 2 Compugraphic typefaces as well as the "Gold Disk" kind, as used by *PageSetter II* and *ProPage*.



Special effects can be created easily and quickly. Here the Distort and Rotate tools have been used to give the logo some perspective

Can it, by golly? I wish they'd tell me how! There are no instructions concerning this in the manual, and I've faffed about until blue in the face trying to get it to use the Compugraphic typefaces supplied with Workbench 2. I eventually managed to get *ProDraw* to recognise and use CGTimes by assigning the logical device CGFonts: to 'Fonts:_Bullet_Outlines', re-installing the program and running *ProDraw*'s CG_Update program, but no way would it let me get at CGTriumvirate or LetterGothic.

Still, it works with the Gold Disk kind OK, and most people will be using a large library of these so I guess it's not too much of a problem right now. Definitely something Gold Disk needs to sort out though.

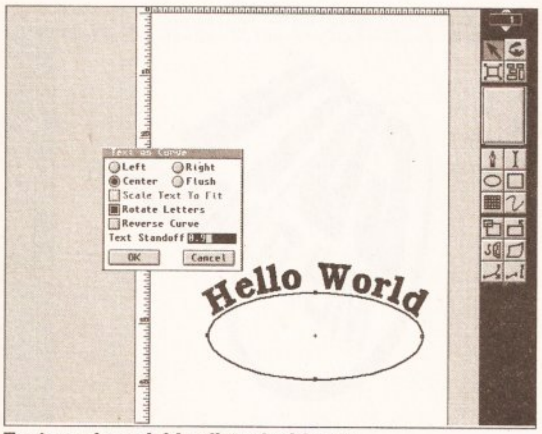
The Text requester is much enhanced. Tracking and Kerning distances can be specified, as in version 2, but new to version 3 is Line Spacing, Shear, X and Y Bold, and Aspect Ratio.

For the life of me I can't get the automatic Kerning feature to work – not even with the Gold Disk Compugraphic typefaces which are supposed to contain correct kerning information. On or Off, it seems to make no difference; instead I have to enter a negative Tracking distance.

The addition of Line Spacing may give you a clue that *ProDraw* now allows you to type text directly on to the page – when you press the Return key the cursor is moved to the start of the next line, directly underneath the start of the text above, distanced from the line above

Line Spacing amount, specified either as a percentage or an actual measurement in inches, centimetres or picas and points.

Eight sizes of text from 24pt to 144pt are available on buttons, or you can enter a custom point size into a gadget, up to 1,440pt, which is twice the maximum size in *ProPage*.



Text can be quickly aligned with any curve, no matter how wiggly

Shear is entered in degrees, -45 to 45 in 0.1 degree steps, the effect of this being to slope text backwards or forwards. If you need to shear to a greater angle than this (unlikely) then you can use the Distort tool, which will shear vertically as well as horizontally. The Distort tool will also enable you to 'bend' objects or groups of objects, and alter their perspective.

X and Y Bold affect the horizontal and vertical strokes of characters. A zero percentage is the normal typeface, 100 per cent is similar to the normal bolded typeface, -100 per cent would approximate a 'light' version of the typeface. The overall size of the characters does not change, just the thicknesses of the strokes. I've found that it works fine with commercial Compugraphic faces like those supplied with *ProPage* and those in the Outline Fonts pack, but I've had no success here with the scores of PD faces that have been converted to Compugraphic from Adobe Type 1.

Aspect Ratio affects the width of characters, so a figure of 50 per cent would result in characters that are half as wide as normal.

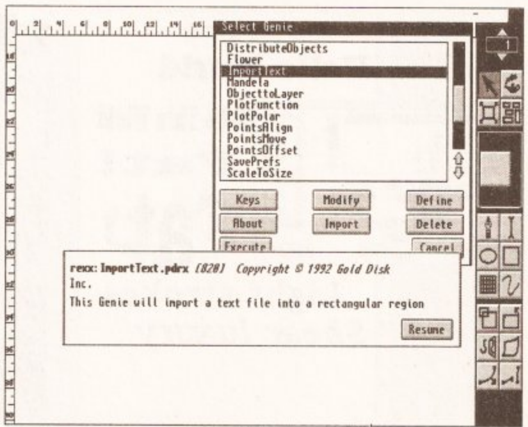
The old *ProDraw* '.pdfont' typefaces are still supported should you require to use them (Times and Triumvirate PDraw typefaces are the only two typefaces that come with the package), and everything in the Text requester works with them except for X and Y Bolding.

To begin with, text typed with one use of the Text tool (that is, until you hit the Null Pointer tool) is seen as a single object, even if it is spread over a number of lines. This object can be manipulated in the same ways as any other object. Should you want to justify some lines of text, a special menu item will split the object into one object per line of text, and the Align facility can be used to left, right or centre justify. Another menu item will completely ungroup the text – Text –> Graphic as the menu item calls it – allowing you access to each and every control point of every individual character.

DREAM GENIES

What makes *ProDraw 3.0* really special are the Genies. For these to work you need ARexx (which comes free with Workbench 2) installed and running.

More than half of the Supplement Manual (about 35 pages of it) details the ARexx commands and the Function and Tool Genies. Over 30 Function Genies are provided, which do jobs as mundane as copying and deleting a range of pages, through useful jobs like converting colours to shades of grey, up to incredibly powerful things like drawing flower-like objects and plotting



The Genies are a wonderful invention, there's even one that enables text files to be imported into a rectangular region, making it easier to set and manipulate paragraphs of text for things like publicity leaflets

mathematical functions.

Sets of often used object attributes can be turned into Style Tags, enabling you to create other objects quickly in the same style – with the same fill colour and line colour, line join, line pattern and line weight.

You may have used programs that have 'ARexx ports' before. You might have looked at the documentation for the ARexx commands and thought "Sod that for a game of soldiers". You may have used programs that come with a few ARexx scripts supplied attached to function keys. But Gold Disk's Genies, although they are just ARexx scripts, are like nothing you have seen before.

Genie selection is carried out via a normal file requester which lists all the Genies available. An About button will tell you more about the selected Genie (actually it's the first 'comment line' of the script) and after executing a Genie you will get either another requester asking you to specify more details (line weights, colours and so on) or prompts along the title bar asking you to do some action like click on an object.

The system integrates so seamlessly that if you didn't know it was an ARexx script, you'd think it was just another *ProDraw* feature.

There's even a Genie Editor built into *ProDraw* (not a separate program) which is basically a very simple text editor. You can edit existing Genies, or create new ones. But you'll need to learn about ARexx and *ProDraw*'s ARexx commands first of course. It isn't that difficult. It's easier than programming in BASIC. The best way to learn is probably to study the supplied Genies and then alter them slightly to see what happens, but a good book on ARexx wouldn't go amiss.

Like its sister DTP program, *ProDraw 3* demands hefty system requirements – a hard drive and at least 2Mb of memory. To activate the 'hotlink' to *ProPage 3* – which means you can send clips from *ProPage* straight to *ProDraw* for editing, and then back to *ProPage* again – both programs must be up and running, meaning 4Mb minimum.

To those who can't afford it this might appear to be a bit of an 'élitist' attitude, but anyone who owns a hard drive will tell you what a world of a difference it makes. It's not so much the greater speed and storage capacity, although these are important of course, it's first and foremost the fact that all the 'system' files which almost every piece of Amiga software requires are easily available on the one 'volume' – no more making up bootable disks that don't work properly because you (or the installation program) forgot to copy an important file into the correct directory.

The memory requirements are so high because the program is doing jobs that require lots of memory. Whether you can afford it or not, you can't fit a quart into a pint pot. It's a wossname, that. Fact of something. Life.

No program is ever perfect, there are always bugs and room for improvement, but *ProDraw 3.0* provides exceptional power combined with quality output at an extremely attractive price, especially considering a whole disk of structured art is thrown in free of charge. AS

SHOPPING LIST

Professional Draw 3.0...... £129.95
by Gold Disk Inc
PO Box 789,
Streetsville,
Mississauga, Ontario,
Canada L5M 2C2

Distributed in UK by:
HB Marketing
Unit 3, Poyle 14,
Newlands Drive,
Colnbrook SL3 0DX
☎ 0753 686000

Note that ProDraw 3.0 and ProPage 3.0 can now be bought as one bundle for as little as £165 or less. Shop around!

CHECKOUT
PROFESSIONAL DRAW 3

Ease of Use ●●●●○
Structured drawing takes a while to get used to, but once you get the hang of it, *ProDraw* is not difficult to master.

Features ●●●●○
Needs to support the IFF-DR2D structured drawing format. Plus it desperately needs either on-screen support for Encapsulated PostScript files or the ability to convert EPS format to Clip format.

Speed ●●●○○
I guess it's going as fast as it can, and there are several options to speed things along, but to be used productively structured drawing packages really need a faster processor than the standard 68000 chip.

Documentation ●●●○○
The manuals are short, easy to read and contain plenty of pictures and step-by-step instructions. Could do with a tutorial on how to write your own Genies.

Price Value ●●●●○
At about the same price as a good word processor, *ProDraw* has enough powerful features.

Overall rating ●●●●○

Pounds per feature, the best Amiga structured drawing package. But to hold its head up in the desktop publishing world it desperately needs on-screen EPS support. Even a bitmapped representation would be better than an empty square.

Shake, rattle and strum...

In the Amiga music world the guitar undeservedly gets little exposure. This month Paul Overaa flexes his plectrum and sets the record straight with a few pointers as to what you should consider when it comes to choosing a MIDI guitar

Despite how it might look, guitarists, like other non-keyboard playing musicians, are not completely left out of the MIDI/music revolution. They do however often seem to be regarded, and treated, as 'poor cousins' as far as the high-tech MIDI world is concerned. That said there are actually two areas where a guitarist can use MIDI. Firstly, guitar synthesisers, 'MIDI guitars', are available that can transmit the appropriate MIDI data as it is played and this enables the guitarist who does no want to use the more conventional synthesiser keyboard to still get into Amiga MIDI sequencing. Secondly there are MIDI controllable amplifiers and effects units that can also be used by the conventional guitarist.

As far as the first area, the MIDI guitar, is concerned the reason that MIDI guitars do not get as much Amiga MIDI/music magazine coverage is because there are relatively few Amiga musicians who actually use them. This doubtless stems from these beasts having a relatively poor track record.

MIDI GUITARS

Converting sounds into MIDI information is a job which, from a technical viewpoint, is far from easy and inevitably snags have been encountered along the development road. Early MIDI guitars in fact suffered from so many 'tracking' problems (resulting in wrong notes, notes jumping up and down by a semitone, notes cutting off and so on) that they were virtually unusable outside of a studio.

Guitars, like most stringed instruments, are always prone to tuning problems and so the above MIDI difficulties were compounded especially when people tried, as they did, to convert ordinary guitars to MIDI guitars by adding specially designed 'MIDI pickup' units. The approaches, and the technology used, have however matured over the years and MIDI guitars have now improved to the extent where their use to generate MIDI data for an Amiga sequencer is certainly feasible.

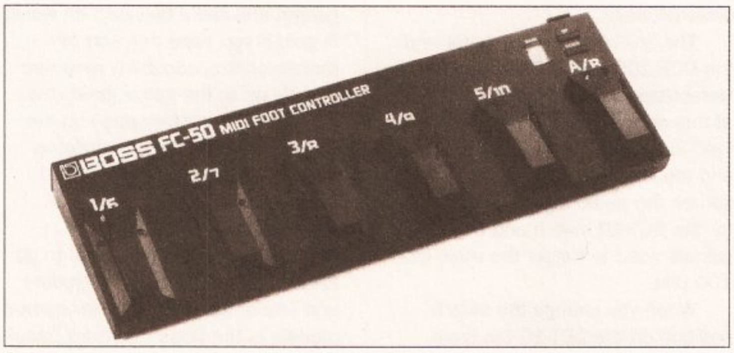
The task of converting a guitar note to an appropriate MIDI message is however still a relatively difficult job.

All MIDI guitars take a bit of time to do the necessary conversion. It may only take a tenth of a second or so, but the result is that if you expect to be able to pick up a MIDI guitar and play fast or do Eddie Van Halen style tricks, then you are going to be disappointed.

STYLE WARS

As far as bending notes and playing chords go, however, most MIDI guitars can provide reasonable performance but you still have to adjust your playing style very much to the guitar rather than expect the MIDI guitar to adapt to your particular playing technique – and as far as playing fingerstyle on a MIDI guitar is concerned, you might as well forget it...).

The need for playing technique adjustment is another thing that has limited the interest in the MIDI guitar – in short, many guitar purists find this a serious limitation. Not only do most guitarists feel uncomfortable about such restrictions, but in addition to this, all of the harmonics, flicks, note hammers, vibrato effects, etc (that is, the things that set guitar music apart from other instruments) get lost along the way. At the end of the day the fact is that there is little that can be done on the MIDI guitar which couldn't be more conveniently achieved with a cheap synth keyboard anyway.



Get those toes in motion with a MIDI guitar foot controller. The Boss FC-50 six pedal controller board is ideal for creating stunning guitar sound

Another snag that is sometimes still encountered is 'MIDI clogging'. This is caused by the enormous amounts of data that can be generated when you bend notes. Nowadays most guitar synths do however provide modes which can reduce the amount of bend information transmitted. Basically these limitations are things you have to live with if you want to use a MIDI guitar.



Casio's Professional PG-380 Digital Guitar is one instrument sure to get you noticed

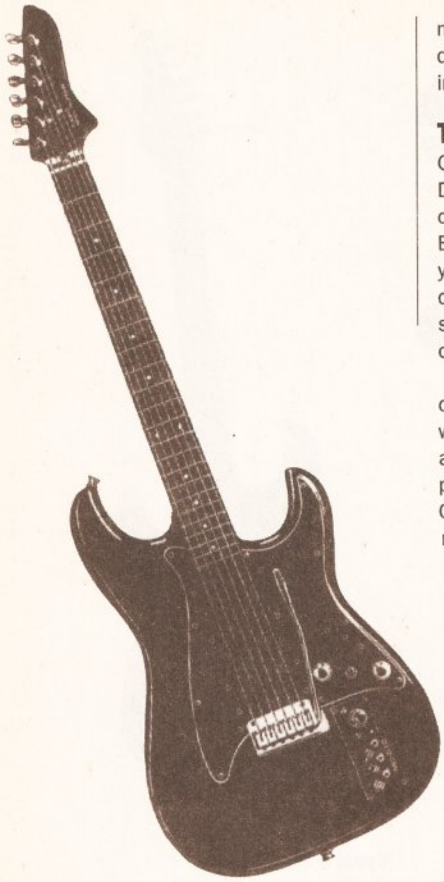
THE UPSIDE

To be fair there are benefits as well. Most MIDI guitars have conventional pickup circuitry and audio signal output as well as MIDI output facilities, so the sounds created by the MIDI guitarist can come from both the sound modules and synthesisers being driven by the guitar's MIDI output, and form the output to a conventional guitar amp. This makes it possible to get excellent 'split sound' effects. If MONO mode is supported you can even have the six strings on six different MIDI channels which means that each string can be given a different synthesiser voice!

The prices of MIDI guitars vary a lot and in most cases the more you pay, the better the instrument will be. At the lower end of the scale, prices are still likely to be in excess of £400, but it is possible to pick up far more reasonably priced items secondhand. Casio, for instance, produced a range of guitars which was moderately successful: items from this range, such as the MG-510, PG300 and PG380 can now be picked up surprisingly cheaply.

CONTROLLABILITY'S THE NAME OF THE GAME

The other main use of MIDI for a guitarist is in controlling other devices such as digital delay units, distortion and other effects, and perhaps even his or her guitar amplifier (a few of these are MIDI



Casio MG-510 – Seek and you will find... second-hand guitars like this one at amazingly cheap prices

controllable). This might be done as part of an Amiga-based sequencer set-up by embedding the control data in the song sequences themselves or it might be achieved by adding real-time control using a device which can generate MIDI control information.

REAL-TIME CONTROL

For real-time control, the guitarist needs a unit that is convenient to use – remember here that, unlike keyboard players, a guitarist's hands are usually fully occupied all the time. Many guitarists also play standing up. There are quite a few add-on foot pedals, such as the Digitech PDS3500, that can send the appropriate program change messages and there are also units designed with the guitarist especially in mind.

THE DATACASTER

One such device, called the Datacaster DCT-10/DCR-100 unit, comes from the US-based Lake Butler Sound Company. It enables you to send MIDI program change commands by using a ten position switch which is actually mounted onto the guitar itself.

The DCR-100, the guts of the device, is a 1U rack-mounting unit which control-wise is a pretty simple affair... the back panel has the power connector and a single MIDI-OUT terminal, the front panel has the rotary click-dial bank and channel switches, the instrument sockets and an extra input terminal (for specialised wireless-link use).

At the guitar end you've go to mount the DCT-10, the ten way control pot, on to the guitar. The DCT-10 is only a little larger than a normal volume/tone pot and will fit into most existing control areas quite easily.

You could, for example, rewire a Strat-style guitar to a master-volume/master-tone configuration and then put the DCT-10 in the unused tone position. The alternative is to fit the DCT-10 as a separate control and here, unless you know what you're doing, the best idea is to have it fitted professionally.

The link between the guitar and the DCR-100 unit is via a special Datacaster stereo cable. The benefit of this arrangement is that only one lead is needed between the guitar and the DCR-100 unit. This lead carries the audio signal, the power for the DCT-10 switch and the signals used to trigger the main DCR-100 unit.

When you change the switch position on the DCT-10 the main DCR-100 unit is triggered and that in turn generates the appropriate MIDI program change message.

The Datacaster is certainly simple to use... you set the channel on the main unit and then select one of the 13 'bank' positions (numbered 0-12).

In bank position 0 the guitar control will generate program change messages numbered 0-9; in bank position 1 messages 10-19 are produced and so on. This means that unless you want to walk over to your rack to change the bank setting you are limited to generating a range of just ten program change numbers.

In the past this would have been a pain but nowadays, providing the equipment you want to control has a user-definable program change table, it's not so much of a limitation (unless you are going to need to switch between more than ten different types of effect).

As well as just patch selection, it's also possible to use the Datacaster in conjunction with other MIDI control units and the only real drawback to all this MIDI controllability magic is the price – the Datacaster costs £299 (including VAT). Nevertheless it is a useful gadget and could be worth its weight in gold if you need this sort of remote control capability mounted directly on to the guitar itself. (You can get further information on the Datacaster from Dixies Music on 0484 512601).

> "For real-time control, the guitarist needs a unit that is convenient to use"

CONTROL BY TOE

Most guitarists however tend to go for the foot pedal style controllers and one of the most popular current models is the Boss FC-50 six pedal foot controller board. The FC-50 has six foot controls and four control exchange jack-sockets which can be used to sense the state of a number of external pedals or switches and then generate and transmit the appropriate MIDI controller messages.

Sockets for two external expression pedals and two foot-switches are available and this enables MIDI volume information (continuous controller #7) and general purpose continual controller (#16) messages to be added to the MIDI output stream. The two switch type controller messages are implemented as the hold controller #64 and a general purpose #80 controller (recommended FC-50 add-on pedals are the Roland EV5 and the Boss EV10).

A controller board such as the FC-50 can therefore allow the guitarist to select particular settings or 'programs' remotely without the need to make manual changes to the front panel controls of their MIDI equipment. Some MIDI units have permanently fixed, pre-programmed, program-change relationships, so that sending a program change #12 message, for example, will always select a particular setting.

Other units employ somewhat more flexible arrangements based on the use of user-definable, internally memorised tables. The benefit of this latter arrangement is that the user can not only define the result of a particular program change command, but also edit such tables if it becomes necessary to do so. The reason I've mentioned this is that when you're using a controller like the FC-50 it is often convenient to arrange to use sets of program change values that are numerically close to one another. Obviously this is not necessarily possible when the unit that you are controlling uses fixed program-change correspondences.

The FC-50 costs £158 (including VAT). It is both well made and competitively priced and as a dedicated foot controller it does as good a job as many of the more expensive units currently on the market. (For more details on the FC-50 give Roland (UK) a call on 0252 816181).

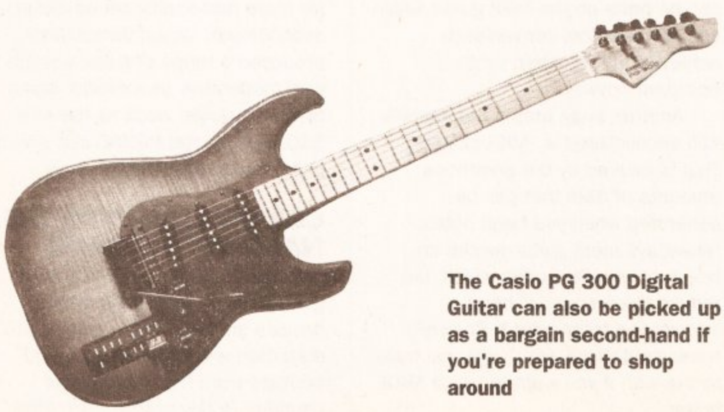
AT THE AMIGA END

If you are choosing a sequencer for use only with a MIDI guitar then it is worth remembering that not all sequencers are equally convenient when it comes to particular types of event editing. Sequencers which offer controller thinning, splitting and stripping facilities are particularly useful to have around (Dr T's KCS and Passport's Master Tracks Pro are two of the heavyweight sequencers that have proved their worth in these areas).

CLOSING THOUGHTS

Although I've not experienced too many problems with the MIDI guitars that I've used, it's only fair to point out that over the years I've heard more than a few MIDI guitar related horror stories.

It is always difficult to tell whether snags arise because of real hardware or software faults, incompatibilities between particular combinations of equipment or whether they are just the result of the misfortunes of a user who is new to MIDI. As always it is usually easier to err on the side of pessimism and although not always easy to arrange, that ideally means trying the Amiga sequencing software with the actual MIDI guitar that you will be using.



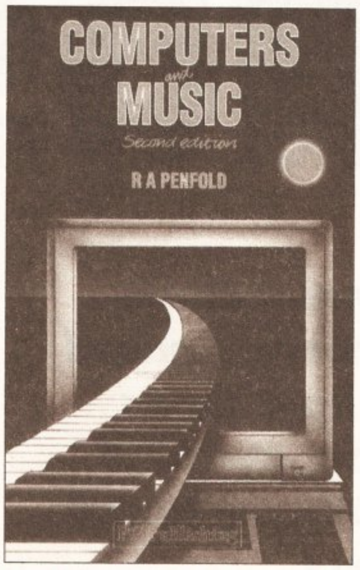
The Casio PG 300 Digital Guitar can also be picked up as a bargain second-hand if you're prepared to shop around

Read all about it!

Whether you're new to music on the Amiga or an expert, there'll always be times when you need to lay your hands on a good book. Paul Overaa pours over three offerings from PC Publishing designed to help you through the MIDI music maze

Were you to pop down to your local bookstore tomorrow, you'd be faced with shelves full of music books. Each one of those books, if you were to believe the blurb on the back, would promise to make the secrets of music making available to you. More often than not a casual book purchase (the 'yeah, this one will do'-syndrome) can be a disappointment when you get the book home and try to put all the book's knowledge into use. So, this month, I've decided to take a look at three books from PC Publishing and give a no-fuss guide to their contents. If you're a beginner, remember not to buy a book which jumps right in at the deep end – this will only leave you confused and liable to give up right away. In any case, one of the following should see you sorted...

BOOK REVIEW



COMPUTERS AND MUSIC – 2nd Edition

Author: RA Penfold
Publisher: PC Publishing
Price: £8.95
ISBN: 1-870775-32-5

This edition, only just published, is aimed at the musician wanting to jump on the computer/MIDI band-wagon and has been updated to include more information on Amigas, PCs and the newer Atari machines.

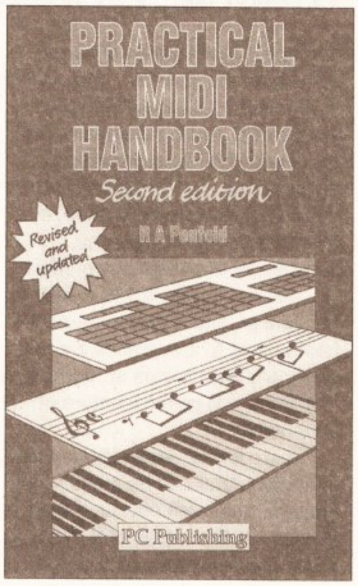
The first few chapters are devoted almost exclusively to computers and what they can do providing a 'from scratch' intro-duction explaining how computers work and looks at their keyboard layouts. It also explains how to get data into, and out of, these beasts that are slowly taking over our lives.

> **"Computers and Music does not expect you to be a computer genius"**

From time to time there is the odd diversion into topics which get a little technical (such as the sections on serial and parallel ports), but on the whole these early chapters are very readable. If you are new to, or intimidated by, computers you'll find this material very reassuring. The introduction to MIDI itself provides a fairly standard discussion outlining why MIDI happened, how it works and the purposes of the various types of MIDI messages. Subsequent chapters deal with music software, sequencers/voice-editing software etc, and the use of MIDI instruments.

There's a useful glossary followed by appendices dealing with such things as hexadecimal numbers and software/sequencer checklists. *Computers and Music* neither aims to make you a computer genius, nor does it expect you to be one in the first place. It's simply been written for people who want to learn how to use computers to make music!

BOOK REVIEW

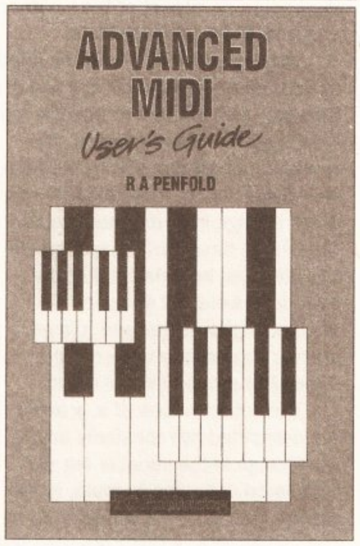


PRACTICAL MIDI HANDBOOK – 2nd Edition

Author: RA Penfold
Publisher: PC Publishing
Price: £6.95
ISBN: 1-870775-13-9

This edition, like its predecessor, is intended for musicians who want to exploit the vast capabilities of MIDI but have no previous knowledge of what MIDI can do. It covers all the MIDI based equipment you can use – keyboards, drum machines, sequencers, effects units etc. It also includes sections on the various types of software which are available. In a sense it continues where *Computers and Music* leaves off.

BOOK REVIEW



ADVANCED MIDI USERS GUIDE

Author: RA Penfold
Publisher: PC Publishing
Price: £9.95
ISBN: 1-870775-18-X

This third book is aimed at those people who have previous knowledge of MIDI and electronic instruments and is designed to give readers a more detailed understanding of MIDI's capabilities and limitations. The first chapter provides the usual explanations of the various MIDI message classes but after that come chapters on all sorts of goodies. There is a good account of MIDI routing and the chapter on troubleshooting even includes guidelines on writing simple MIDI analyser programs in Basic.

A chapter on synchronisation includes discussions not only of MIDI clock syncing but SMPTE timecode as well (MIDI Timecode info is provided separately in one of the appendices). There is, incidentally, a reasonably good introductory chapter on MIDI programming and another on the format and use of system exclusive messages.

Some knowledge of Basic programming would make some of the topics covered more digestible but on the whole you need to be a MIDI enthusiast, not a programmer, to get the most from this offering. Perhaps the best thing about this particular book is that it covers its subject areas in a detailed, but general, way. This means that it is a useful aid to any musician regardless of the computers or software packages they are using! AS

BUYING INFORMATION

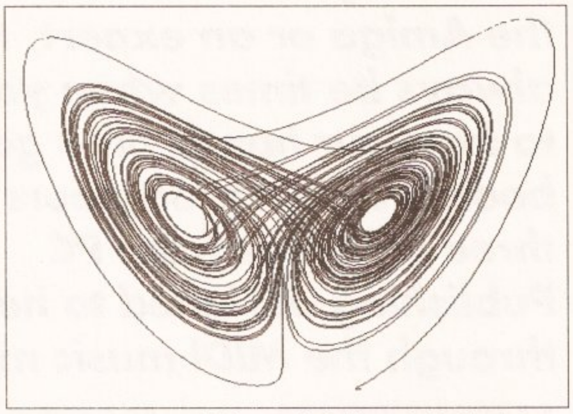
All these books should be available from your local music store or bookshop, but in case of difficulty they can be obtained directly from... PC Publishing, 4 Brook Street, Tonbridge, Kent TN9 2PJ. Alternatively you can give PC Publishing a call on ☎ 0732 770893

(Adding £1 for post & packing in the UK or £2 for overseas orders).

Chaos

In the third instalment of our series on chaos theory, Conrad Bessant explains how chaos intervenes to hinder even the most technologically advanced weather forecasters

Weather forecasters had always believed that they could represent the world's weather using a complex mathematical model, just as astronomers could use maths to predict the positions of the planets. When the first computers appeared in the 50s and 60s the forecasters hoped that the new machines would be able to perform the multitudinous calculations needed to run their weather models. With politicians realising the military and economic importance of accurate weather forecasting, considerable funds were allocated to meteorology, the science of weather forecasting.



This may look like a butterfly, but it's really an illustration of the Lorenz attractor in action

MODELLING THE WEATHER

One beneficiary of the resulting forecasting boom was Edward Lorenz, a keen mathematician and experienced meteorologist who was quite at home writing programs on his rather rudimentary (in relation to the Amiga) computer to model simple weather systems. Lorenz simplified the weather down to a fluid dynamics system, sea and air being fluids, and chose three equations to represent different elements of the weather. Each equation interacted with the others, and although the model was very simple the output from it had some interesting similarities with the behaviour of real weather. The three equations are:

- ***dx/dt = a*(y - x)***
- ***dy/dt = b*x - y - x*z***
- ***dz/dt = x*y - c*z***

where: ***x, y*** and ***z*** are variables, each represents an aspect of the weather and ***a, b*** and ***c*** are constants.

These equations cannot be used to find the new values of ***x, y*** and ***z***, they are used instead to find the rate of change of these variables. For example, ***dx/dt*** represents the rate of change of ***x***, or more explicitly the small change in ***x*** (***dx***) that occurs in the (small) time, ***dt***. The reason the change must be small is that the equations were not designed for large changes; to perform a large change you have to carry out the equivalent group of small ones.

The actual values of ***x, y*** and ***z*** are calculated by repeatedly adding the change in the variable (eg ***dx***) calculated using the formula, to the previous value of the variable (eg ***x***). The values of ***x, y*** and ***z*** are then fed back into the equations to calculate the next set of changes. The act of feeding in the old results to get the next set of results is called an iteration. The Lorenz model is known as an iterative process (just like the May equation discussed last issue).

Lorenz's original programs used these three equations to produce a list of numbers, much like these...

Iteration:0	**x=1.000**	**y=1.000**	**z=1.000**
Iteration:1	**x=1.00**	**y=1.260**	**z=0.983**
Iteration:2	**x=1.026**	**y=1.518**	**z=0.970**
Iteration:3	**x=1.075**	**y=1.780**	**z=0.959**
...		...	...

These meant a lot if you could decipher them, but trends and repetition were hard to spot; obviously a graphical representation is better. A simple line graph of some of the information can be created on the Amiga with a simple Amiga BASIC program, such as Listing 1. This plots the value of ***z*** against time, giving a single line which can be described as a forecast of one of the three weather aspects of Lorenz's model.

This program can be broken down into two main sections, the first is the initialisation of all the constants and variables. The second is the loop in which successive values of ***x, y*** and ***z*** are calculated, and where ***z*** is plotted vertically against time. It is important that all three variables are calculated, even though only one is displayed, because all of the variables interact.

The line in Figure 1 is similar to the kind of output you can expect from Listing 1. The graphs are not especially nice to look at, but they do reveal the non-periodic nature of the equations.

There are several experimental alterations that can be made to the program, the most obvious things to change are the values of ***a, b*** and ***c***, and the initial values of ***x, y*** and ***z***. You could also change the LINE command so that ***x*** or ***y*** are plotted instead of, or as well as, ***z***.

LISTING 1

```
REM Set up constants
DEFDBL a-c,x-y
a=10
b=28
c=8/3
dt=.01
detail=10
REM Set up initial ↵
values of variables
x=1
y=1
z=1
REM Move to starting ↵
point
PSET(-1,0)
FOR t=0 TO 319
  FOR dummy=1 TO detail
    REM Calculate ↵
increments
    dx=a*(y-x)
    dy=b*x-y-x*z
    dz=x*y-c*z
    REM Calculate new ↵
values for x, y and z
    x=x+dx*dt
    y=y+dy*dt
    z=z+dz*dt
  NEXT dummy
  REM Plot the line
  LINE -(t*2,200-z*3.5)
NEXT t
```

THE BUTTERFLY EFFECT

Lorenz's most important discovery however was probably accidental. Wishing to continue an earlier run of his model Lorenz used initial values of ***x, y*** and ***z*** taken from an earlier print-out. He assumed that the fact that the values on the print-out were rounded off to three decimal places (from his computer's more accurate internal values) to save space would make little difference to his results.

To simulate the original run of the model we can alter the relevant lines in Listing 1 so that the initial values of ***x, y*** and ***z*** are set up as follows (it is important to type the numbers in full):

```
x=8.16468
y=8.96761
z=25.5002
```

These numbers are of the same precision as those used internally by Lorenz's computer, and are said to be shown to 6 significant figures. If the program is now executed a graph similar to the solid line shown in Figure 2 will be produced, which is not particularly unusual. However, if the program is executed with the initial values rounded off to four

FURTHER EXPERIMENTATION

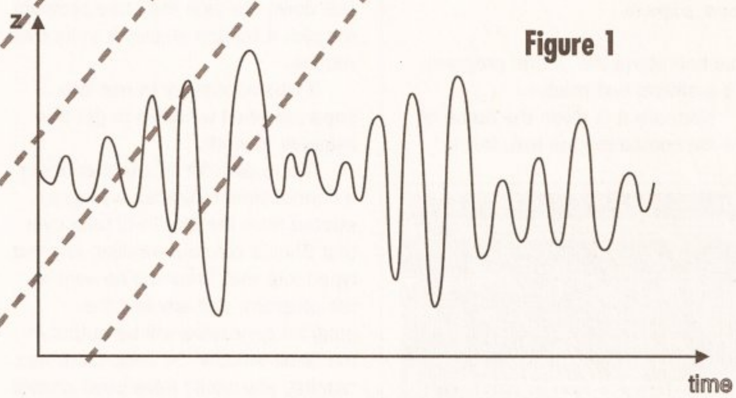
The Lorenz attractor never intersects itself. Because the attractor is three dimensional and the Amiga's screen is only two dimensional, it often looks as though intersections are occurring where lines are actually passing behind or in front of one another. The simplest way of verifying the non-intersecting nature of the attractor, without wading through a lot of maths, is to use colour to represent the third dimension. If each point is plotted in a colour proportional to the value of ***y*** in the program given in Listing 2 then, ideally, two adjacent pixels would be touching only if they were both of the same colour. However, the range of values for ***y*** is much larger than the number of colours on the Amiga, so this method is unworkable.

significant figures different results can be seen. The initial values can be rounded off by changing the relevant lines to read as follows:

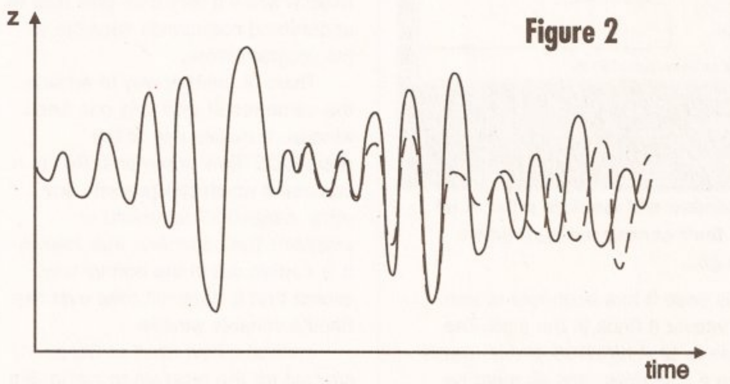
```
x=8.165
y=8.968
z=25.50
```

Rounding these numbers off is effectively what Lorenz did by typing

rains



A typical Lorenz time series graph produced by Listing 1



The growing difference between the graphs is caused by the butterfly effect

in his old printed out values. The output from these less precise initial conditions is shown as the dotted line in Figure 2. Comparing the two lines reveals that although they follow the same path for the first few iterations they gradually diverge into totally different patterns. The effect witnessed here is what is technically known as sensitive dependence on initial conditions, meaning that the equations are so sensitive to the initial values supplied to them that even the smallest difference quickly grows into a large difference.

Lorenz realised what his results meant immediately, they showed that his model, and hence the weather, had a sensitive dependence on initial conditions. Ultimately this meant that weather prediction was practically impossible, because even the smallest error from a thermometer or other instrument would send a forecaster's model off down an increasingly wrong track. Other meteorologists took a more optimistic view, believing that they could alter future weather by making the relevant small changes such as heating small areas of land. They were right, but Lorenz pointed out they could not control the weather with any precision, as the effects of the small changes that they made would be impossible to predict because other, undetected, small changes would have equally large results. Some argued that a complex system such as the weather was so sensitive that the path of a hurricane could be altered by a butterfly flapping its wings on the other side of the globe. Hence the name butterfly effect was coined as the common term for sensitive dependence on initial conditions.

WATCH YOUR STEP

A more down-to-earth example of the butterfly effect is the story of an airline company going bankrupt. A man leaves his house on foot one morning, intending to visit the travel agent to book his holiday. As he walks down the street he notices that his shoelace has come undone so bends down to tie it, in doing so he loses his balance and falls into the road. As he stumbles, a passing bus collides with him and he is taken to hospital. The man is then unable to book his flight before the dead-line, meaning that the airline is one person short of the quota needed to make the flight financially viable. The flight is cancelled, and ticket holders refunded, but with the absence of the income from that flight the already financially troubled airline company goes bankrupt.

It seems incredible, you never read of companies going bankrupt because of undone shoelaces, but it could happen, and it would be almost impossible to predict.

THE LORENZ ATTRACTOR

The Lorenz model has three variables, three directions in which it can change, and is therefore said to be three dimensional. This means that instead of simply plotting a time series graph of one variable against time we could plot ***x*** against ***y*** against ***z*** on three dimensional axes. The shape produced is known as the Lorenz attractor, an infinitely long complex spiral which never intersects itself. Plotting it in all three dimensions is rather involved and unnecessary, as a good representation can be achieved by plotting ***z*** against ***x*** in two dimensions. The illustration shows the graph that results from this process. To appreciate the line's behaviour it is necessary to see it being drawn – just run Listing 2 to see it for yourself.

The name Lorenz attractor requires some explanation. Attractor is a piece of mathematical jargon used to describe a set of points, in an imaginary mathematical space known as phase space. Each point on the attractor represents the state of the system at a particular time, and the line showing the sequence of these points is known as the trajectory. By looking at the trajectory of the attractor the behaviour of the system can be determined. The idea of attractors has been around for some time, but non-periodic attractors (called strange attractors) such as the one created from the Lorenz model are relatively new.

As Listing 2 shows, the trajectory behaves unpredictably, switching from lobe to lobe almost at random, but it does produce a very complex structure and the trajectory is constrained within a certain range. One of the line's curiosities is that it never intersects itself, although on the two dimensional screen of the Amiga it looks like it does. Because the Lorenz attractor is non-periodic it cannot intersect itself, if it did it would rejoin an old trajectory and periodically repeat. However, if we believe this we must also believe that an infinitely long line can exist in a finite three dimensional space - an interesting paradox!

The butterfly effect raises an interesting question: what is the real Lorenz attractor? Lorenz drew his first diagrams using output from a program using numbers correct to six decimal places. Double precision variables in Amiga BASIC are considerably more accurate, so our program produces different output to that obtained by Lorenz, so who is right? This is a good question, but although the values may differ the general characteristics are the same.

NEXT MONTH

In the next instalment of chaos I'll be taking a look at the truth behind the infamous Mandelbrot set.

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LISTING 2

```
REM Set up constants
DEFDBL a-c,x-z
a=10
b=28
c=8/3
dt=.01
detail=10
REM Set up initial ↵
values of variables
x=1
y=1
z=1
REM Move to starting ↵
point
PSET(314,197)
WHILE MOUSE(0)=0
  REM Calculate ↵
increments
  dx=a*(y-x)
  dy=b*x-y-x*z
  dz=x*y-c*z
  REM Calculate new ↵
values for x, y and z
  x=x+dx*dt
  y=y+dy*dt
  z=z+dz*dt
  REM Plot the line
  LINE -(300+x*14,200- ↵
z*3.5)
WEND
```

more FUN

Cliff Ramshaw explains how doing several things at once, far from being a pain, can actually work to your advantage. This month he looks at multitasking from the Shell

One of the best ways of becoming familiar with many aspects of the Amiga is via the Shell, and this is certainly true of multitasking. Last month I outlined the principles behind multitasking itself, now we're going to take a look at some of the *AmigaDOS* commands that are specifically designed to deal with multitasking.

I finished last month with a brief mention of the 'Resident' command. The command's basic function is to make a copy of further *AmigaDOS* commands in memory.

The advantage of this is that whenever these commands are executed, the Amiga can do so immediately, rather than having to

> **"Commands made Resident must be written with certain constraints"**

load them in from disk first.

You may be wondering why a command such as Resident is necessary to do this. After all, it would be a simple matter to copy any commands needed into the RAM: disk manually. The problem with this approach is two-fold.

Firstly, although the command now resides in RAM:, if the user types its name with intent to execute it, then a further copy has to be made; this copy is placed elsewhere in RAM and is the one that is actually executed. The process of copying, needless to say, takes time. So already we have two copies of the command taking up precious memory.

In addition, if the same command is executed twice simultaneously, then a further copy in RAM needs to be made; similarly for further concurrent executions.

The Resident command enables this situation to be avoided. When a command is made Resident, only one copy of it exists in RAM (and not in the RAM: disk). No matter how many times the command is being executed simultaneously, only this one copy will be necessary. For this to be possible, commands which can be made Resident must be written with certain constraints.

Such a command must be written so that it is 'pure', or re-entrant and re-executable. These are programming terms and not really of importance here, but suffice to say that not all commands in your c: directory conform to the criteria.

In order to make a command Resident, you should type the following:

```
resident c:dir
```

Notice that you have to put the full path of where the command is to be found.

In most cases this will be the c directory of your system disk. Finding out which commands are already Resident can be done by typing:

```
resident
```

Alongside each command listed you will find a 'use count' – it tells you how many times each command is currently executing. In most cases, each command will have a zero next to it, aside from Resident itself (which is also a resident command) which will have a one next to it.

To remove, say, the Dir command from the resident list, simply type:

```
resident dir remove
```

STICK IT IN YOUR PIPE

One of the nice ideas present in *AmigaDOS 1.3* and upwards, taken from the Unix operating system, is that of pipes. A pipe forms a link between two programs, and enables them to exchange information.

The output of one program becomes the input of the other. Pipes only work from the Shell or CLI. Open up a Shell window and type the following for an example of what they do:

```
more pipe:a
```

This line starts the 'More' program. It's a simple text reader.

Normally it is given the name of the file containing the text, but in this case it has been told to use whatever it finds in the pipe. The pipe is an *AmigaDOS* device, much like a disk drive, and so must be written with a colon after it. In addition, a pipe must be named. Here it has simply been called 'a'. At this stage the More window will be blank.

Now open another Shell window and into it type the following:

```
type s:startup-sequence to
pipe:a
```

This line uses the command 'Type'. This normally displays text on the screen, but the destination has been switched from there to the pipe named 'a'.

This is done using the 'to' keyword. You'll see that as soon as the Type command starts sending text down the pipe the More program will pick it up and display it in its own window.

It was necessary to use two separate Shell windows to get this example to work.

The reason for this is that under a normal circumstances a program started from the Shell will take over that Shell's console window. Any text typed into that Shell will be sent to the program, and any text the program generates will be output in the Shell window. So once More was running, you would have been unable to enter the *AmigaDOS* Type command into the same console window since it was then only able to understand commands sensible to the program More.

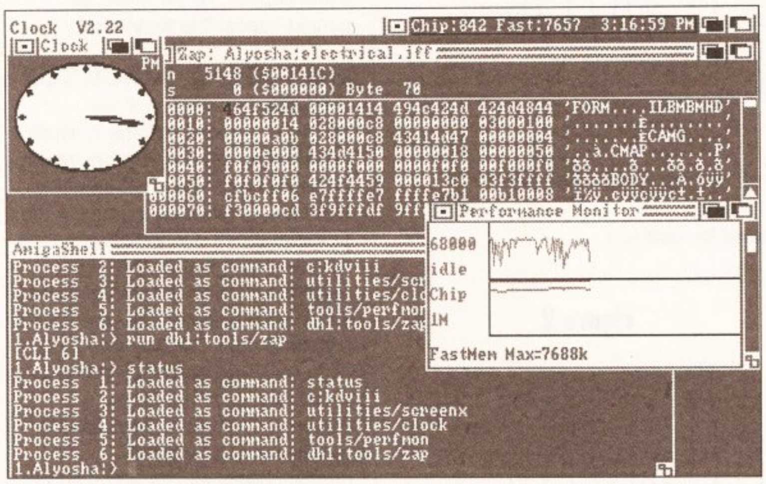
There is another way to achieve the same result with only one Shell window. It makes use of the *AmigaDOS* 'Run' command. Run is a command which can precede any other *AmigaDOS* command or program. The command that follows it is carried out in the normal way, except that it does not take over the Shell's console window.

Instead a new Shell or CLI is created for the program to run in, but this new Shell is without it's own window. The program still sends it output to the Shell window from which it was originated. It becomes what is known as a 'background process'.

Here's how the above example could be done using Run:

```
run more pipe:a
type s:startup-sequence to
pipe:a
```

That's all very well, but really not very much use. After all, the whole thing could be done without the aid of pipes at all, simply by typing:



Typing the AmigaDOS command in a Shell window will result in a list of all the processes currently running, along with their corresponding process numbers. Here we've got quite a few on the go...

than one

```
more s:startup-sequence
```

and cutting out the need for Type altogether.

But there might be cases when the program sending stuff into the pipe has to perform some more complex processing on its data before the program at the other end of the pipe receives it.

"One of its failings is that the files aren't listed alphabetically"

It would be possible to write a single program to perform both tasks, but why bother when two programs already written can be joined together to do it?

The *AmigaDOS* 'List' command gives a list of all the files in a directory. It's similar to the 'Dir' command, but has several more powerful features. One of its failings, however, is that the files are not listed alphabetically. Fortunately however, there is an *AmigaDOS* command – 'Sort' – which will quite happily order items alphabetically.

So the solution to the problem is simple: use List to create the list of files in a directory, then pipe this text to the Sort command, which will put it all in alphabetical order:

```
run list to pipe:a
sort from pipe:a to *
```

The first line should be easy enough to understand. The keyword 'to' is used to tell List to send its output to a pipe called, once again, 'a'.

In the second line, 'from' tells the command sort to receive it's input from pipe 'a'; and 'to' tells it to send its output to... an asterisk!? Well, in *AmigaDOS* the asterisk is used to refer to the current console window – the one you've just been typing in.

Many commands assume that's where you want your output to be sent, so there is no need to say so unless you want the output to go elsewhere, but Sort needs to be told explicitly where to send its results – hence the asterisk, which effectively says, 'just here will do fine'.

In fact, you could turn the above two commands into a single one if you liked. Just enter them both on separate lines in a text editor and save the result. You can then run the program by typing 'execute', followed by the name you have given the file.

STATUS, MR SULU?

Once you get going with multitasking, it's quite conceivable that you have more programs running in the background than you can adequately keep track of. Fortunately, *AmigaDOS* supplies a solution in the form of the 'Status' command.

When typed in at the Shell or CLI, Status will give a list of all the 'processes' running at any given moment. The word 'process' is really just a fancy way of saying 'program', but it is used in technical circles to draw a distinction between programs and 'tasks', which are low-level operating system objects with some, but not all, of the properties of processes.

What it means is that if you type 'status' at the Shell, you will be given a list of all the programs currently running, but not of the myriad individual tasks which are currently running behind the scenes to keep the operating system ticking over.

If you've just booted your machine, opened a Shell window and typed 'status', you should, assuming you have no background programs running, see the following information appear on the screen:

```
Process  1: Loaded as
command: status
```

The only process currently running is the command Status, which is running in the Shell window. If several programs were running, then each would be listed along with its process number.

This associated number is handy because it can be used to shut the process down. Many Amiga programs can be stopped by pressing [Ctrl] and C simultaneously. But this method will only work if the program can accept input from a console window.

If you made the program a background task with the Run command, then the [Ctrl]-C combination (known as a 'break' signal) may not be an option. Try this:

```
wait 60 secs
```

The *AmigaDOS* command 'Wait' simply halts processing for a specified length of time. Until the period is up, you won't be able to enter anything else into the Shell, unless you first stop wait by typing [Ctrl]-C. Now try this:

```
run wait 60 secs
```

You'll find that you can immediately type into the Shell window. If you then type 'Status', you should see the following:

```
Process 1: Loaded as command:
status
Process 2: Loaded as command:
wait
```

The Wait command is running, although of course it isn't doing anything useful. But if you try pressing [Ctrl]-C, you'll find that it has no effect – you can't stop the program.

" 'Wait' simply halts processing for a while"

This is because the break signal is being sent to the Shell, which isn't running anything at the moment and so ignores it. To get the signal to the required program you must make use of another *AmigaDOS* command.

It's called, helpfully enough, 'Break'. It must be followed by the number of the process you wish to halt (which is where Status comes in handy, since it will tell you the number of each process running).

If you try typing 'Break 2' while the Wait command is still running (remember it only runs for 60 seconds), you'll get the following response:

```
1.SYS:> **BREAK
wait failed returncode 10
```

AND FINALLY, A NOTE OF CAUTION

Although the message says that Wait failed, it's not strictly true, since you forced it to fail. But the desired effect has been achieved.

One thing to bear in mind is that it is only possible to stop programs in this way if they have a facility for checking for the [Ctrl]-C combination. Some programs don't, and stopping these might present problems.

Well, that's all for this month folks. Have fun experimenting with multitasking from the Shell, and if you need more information about *AmigaDOS,* have a look at Mark Smiddy's regular Cracking The Shell column, which you'll find on on page 90. AS

DEATH OF A SHELL SCRIPT

As explained elsewhere in this month's article, the *AmigaDOS* Run command can be used to multitask further *AmigaDOS* commands or programs. There also exists a related command used for multitasking scripts.

A script is a text file containing a series of *AmigaDOS* commands. When the script is run, each of the commands in it is executed in turn as if a user were typing them one after the other into the Shell.

Using a text editor, create the following simple script mentioned elsewhere in this article:

```
run list to pipe:a
sort from pipe:a to *
```

Save the file with the name 'ls'. The command to make a script act like an ordinary command is 'Execute'. To run the script, you can type:

```
execute ls
```

If 'ls' were a true command, rather than a script, then the effect the above has would be the same as merely typing the name of the command. To make the script run as a background task, the command Execute can be preceeded by Run:

```
run execute ls
```

SAILING THROUGH C

Cliff Ramshaw introduces you to your first C program, makes a few asides about editors and compilers, parts the waves of confusion and generally shows what a walk-over C can be

This month our C programming tutorial begins in earnest, with a fully executable program. But first let me tell you something about the strange ritual which has to be performed before a program can be run.

Those of you used to programming in Basic may be surprised to learn that programming in C isn't a simple matter of typing a program in and watching it run... oh no, not at all.

THE VIRTUE OF EDITORS

First, you must use an editor to create a text file. This is simply a collection of characters all stored together under a single name, similar to the output produced by a word processor, although editors are designed specifically with the creation of programs in mind. In the context of programming, the text file produced with an editor is referred to as the source file.

Sticking with the disk we compiled last month, we'll use Memacs as our editor. After booting with the NCBoot disk, change directory to the RAM disk with the command:

```
cd ram:
```

We'll do most of our work from the RAM disk, since it is quicker and saves on disk swapping for those users with only a single floppy drive. Bear in mind that anything stored in RAM will be lost if the machine crashes or the power is switched off. At this early stage, we're not writing anything critical so it's not important, but if you want to keep any code for future reference you should make regular back-ups on to floppy or hard disk.

The next thing to do is create the source file. The first program we write is a time-honoured classic in C programming circles – it simply prints the text message 'hello world' to the screen. We'll call the source file 'hello.c' (the '.c' extension denoting that the file contains source code written in C). To create the file type the following:

```
memacs hello.c
```

This actually runs the editor and tells it you're going to be working on a new file called 'hello.c'. Now that you've loaded up the editor, type the following into it:

```
#include <stdio.h>
void main()
{
   printf("Hello world\n");
}
```

> ***"...you might not believe it, but the C program... is designed to be read by humans..."***

Now save the file and exit Memacs. And that's the first stage over with.

NEXT PLEASE

What normally happens next is that the file has to be compiled (which, of course, is the job of the C compiler). A compiler converts a text file into a series of machine code numbers which are directly useable by the Amiga's processor. At this stage of things you might not believe it, but the C program you have just entered is designed to be read by humans, not machines – a translation is required, and that is what the compiler does.

The next stage is to link the program. Put simply, linking is a process which fills in certain gaps left in the machine code produced by the compiler. It may be that your program makes use of some of the Amiga's libraries, or perhaps calls sections of other, previously compiled programs. Even if it does none of this, at the very least it will require the addition of a starting section of code just to set the Amiga up nicely before the program gets on with its main task. The linker acts like glue, joining all of these disparate elements together and producing a finished program. Finally, the program can be run by typing its name at the Shell prompt.

NorthC, you'll be glad to know, goes some way towards simplifying all this. The system comes with a 'cc' command, which performs the stages of both compiling and linking automatically. To produce an executable version of the program you've typed in, just enter the following:

```
cc hello.c
```

This tells the program cc to take the text file hello.c and produce an executable program from it. As it runs, it will first compile the program into an intermediate assembler file. You'll then see this being assembled into machine code. This machine code will then be linked and, all being well, you should be told 'BLINK Complete', along with the size of the finished product.

The program cc names the result

CHOOSING A COMPILER

There are quite a number of C compilers for the Amiga. The package most professionals choose is SAS/Lattice C, available for £229 from HiSoft ☎ 0525 718181. This is a lot of money for a language that you are as yet unfamiliar with, and which you are not sure is the one for you. Far safer, then, to try something from the public domain. We recommend NorthC, a package which includes a linker, assembler and numerous examples. It's on PDOM disk 211. We got our copy from Public Dominator which can be contacted on ☎ 0279 757692. NorthC is now a charityware product. A lot of work has gone into it; and we urge you to send £15 to the Spastics Society as the author Steve Hawtin requests.

JARGON BUSTING • JARGON BUSTING • JA

ANSI C – a standard for the language devised by the American National Standards Institute, which differs from some areas and clarifies others of the original definition of C given by Kernighan and Ritchie, the language's creators.

ASCII – American Standard Code for Information Interchange. It is the data storage method commonly used when we type text files and enables data to be exchanged between different computers.

Assembler – a program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine.

Compiler - A means of translating a program to render it understandable to the computer. A compiler translates the whole thing into machine code before it is run. The compiled program is generally much faster than its interpreted counterpart.

Editor – An editor, like a word processor, is a means of entering text into the computer. Programs are written with an editor before being turned over to a compiler or interpreter.

of its compilations 'a.out', so to try out your work just type:

```
a.out
```

which will ask AmigaDOS to load and run the program of the same name. Because all of the programs compiled with cc are called a.out, if you want to keep your compiled program be sure to save it under a different name before compiling something else.

So how does the program do what it does? The first statement's function is explained in the 'standard library' box, but what about all the rest?

"...the function expects no arguments, and it will be less than satisfied with any other number."

Well, the statement 'void main()' is the beginning of a function definition. Functions are used extensively in C, and every program must contain at least one – the function called 'main'. This is the function which is executed when the program is run. Any further functions are called from within 'main', or from within functions which have in turn been called from 'main'.

Functions normally yield a result. In this case, we don't expect a result, so we say that 'main' is a void function.

NOTHING BUT THE VOID

If we wanted 'main' to give, say, an integer – a non-fractional number – as a result, then the line would be re-written as:

```
int main()
```

The parentheses directly after the function name normally contain the arguments that the function is expecting. The term 'argument' is a fancy way of describing whatever it is that the function needs to operate on. If you imagine a function called 'plus' which added two numbers together, it would require two numbers as arguments and would return a result of one number. The first part of its definition might look like this:

```
int plus(int firstnumber, int secondnumber)
```

In this case of our program, no arguments are needed, so the parentheses are left empty (they themselves must still be included).

The curly brace on the next line tells the compiler that what follows is the actual nuts and bolts of the function we are defining. Similarly, the closing curly brace tells the compiler that we have reached the end of the definition.

In between lies the peculiar statement 'printf("Hello world\n");'. Printf, which means 'formatted printing', is not a C statement as such, but one of the functions of the standard library. This shows how a pre-defined function in C is used: first comes the name of the function, followed by any arguments it needs enclosed in brackets.

With just about every function in C, the number of arguments required is fixed. If a function is defined to need two arguments, then it must be given two arguments or it will not work. In our example, the function 'main' expects no arguments, and it will be less than satisfied with any other number. As luck would have it, one of the most common C functions – printf – is an exception to this rule. It can take a variable number of arguments depending on how many things the programming wants it to print out.

In our example, we are only interested in printing one piece of text, so we only need give printf one argument – the text in question, which must be enclosed in quotes (part of the definition of how text must be presented in C). There's one peculiarity about the text in the quotes: the bit reading '\n'. This is C's representation of a carriage return, ensuring that the next thing to be printed after 'Hello world' comes on a new line.

The only other point of note is the semi-colon at the end of the printf line. This in C is called a 'terminato[illegible]. It lets the compiler know th[illegible] has reached the end of a state[illegible]t.

ENI[illegible] THE LINE

All st[illegible]ents used within a function must be terminated. It's necessary because C doesn't pay much attention to new lines, all it worries about is 'white space', which is defined as any combination of the following: spaces, tabs, and carriage returns. The example program could have been written without a single line break, with each element simply being separated by a space. The splitting of a program across several lines is used simply to make it more readable for humans.

And now it's time to terminate this month's column. Next month we'll be taking our first tentative look at the inconstant world of variables, and we'll be doing some sums.

Until then, have fun with your new found ability to print things on to the screen. AS

THE STANDARD LIBRARY

C's standard library was briefly discussed last month. The use of it ensures that C itself is a small language, with many of its more complex operations being performed by accessing pre-written programs held in the library.

Such programs are standard across all versions of C – they are always called by the same names and produce the same results. Nevertheless, the exact means by which they perform their functions will vary depending on the computer for which they are implemented – printing to a screen on an IBM PC is quite different to printing on an Amiga screen. But because the C library function that handles screen printing is always used in the same way, a program written on the Amiga which makes use of the function can easily be recompiled on a PC and it will work without problems. Hence the library increases the portability of C.

There are many, many functions within the standard C library. They are conveniently sub-divided into a number of 'headers', each of which contains related functions. The header used in our 'hello world' program is the most common. It is called stdio.h, which stands for 'standard input and output header'. In it are all the functions necessary for basic input and output – reading characters from the keyboard or a file, and sending characters to the screen or a file.

To make use of the functions in a header a program must 'include' it; done by use of the 'include' statement:

```
#include <stdio.h>
```

This must appear near the start of the program, before any of stdio's functions are used. When the C compiler sees the include statement it goes looking for a file called 'sdtio.h' in its 'include' directory. Having found the file, the C compiler effectively tags its contents on to the beginning of your program for the duration of the compilation.

The include file contains a series of definitions that will be of use to your program. The imporant one in the 'hello world' program is the 'printf' function. It's very versatile, but here it is used to output text on to the computer screen.

We'll be looking at printf in more detail and some of the other functions in the C standard library as the series progresses.

STING • JARGON BUSTING • JARGON BUSTING

Executable object – a file which can be loaded into the Amiga and run as a program, as opposed to a data file which requries another program to give it meaning.

Interpreter – another means of translating a program for the computer's convenience. An interpreter translates a program line by line as it is running, and therefore tends to be slow.

Library – the Amiga has many special features, and programs are already present in the operating system to make use of these features. These programs, or library functions, may (and should) be used by applications programs, obviating the need for each programmer to write a similar set of routines.

Linker – a program which joins together the various segments of code produced by a compiler, along with any relevant library routines, and produces a finished, executable program.

Object file - A runnable program - one which works without the aid of an intepreter.

Source code – a program represented as a text file and presented to a compiler or assembler for input. The output is known as object code.

DECISION MAKING

All this looping, printing things on the screen and getting input from the user is all very well and good, but the real power of any program comes from its ability to make decisions based around a set of definable rules – if the game is good then play it else chuck it in the bin, for example. Once again, ARexx provides a set of decision making constructs which bear more than a striking resemblance to their BASIC equivalents. The construct that we'll be taking a look at this month is IF...THEN...ELSE.

Well, what more can I say – once more, the ARexx form of the IF construct is so similar to its BASIC equivalent that its needs little explanation. As in BASIC, ARexx' IF construct can be used to test a variety of different conditions by taking advantage of its 'Else If' and 'Else Do' extensions. Indeed, this is probably one aspect of ARexx that is considerably more powerful than its BASIC counterpart. Once again, I think a demonstration program is in order –

```
/*

If construct demonstration

*/

Say "Enter a number"
Pull number1
Say "Enter another number"
Pull number2

If number1 = number2 Then
   Say "They're both the same!"
Else If number1 > number2 Then
   Say number1 "is greater than" number2
Else do
   Say number1 "is less than" number2
   End
```

It's all pretty straightforward. The program starts by asking you to enter two numbers. The IF construct then starts by comparing the values held within the variables 'number1' and 'number2'. If they are equal, the message 'They're both the same!' is shown. If not, the IF statement continues to the next part of the construct where the two variables are compared to see whether the first is larger than the second. If it isn't, the second variable is obvious larger than the first so the message is'is less than' It's also worth noting that our old friend the 'End' command crops up here too. End is a general purpose command that is used to mark the end of the code that applies to a multi-line construct. If it were to be omitted, ARexx would think that all the lines that proceed the construct are actually part of the construct. In any case, you still get an '+++ Error 26 in line nnn: Missing or unexpected END' error thrown up.

AREXX FOR ALL

Jason Holborn continues his series on ARexx, getting to the core of the matter and looking at commands before starting you off on your very first program

After last month's instalment of the ARexx column, you should now be pretty familiar with what ARexx is and what it is capable of. We've seen how it can be used in a number of different ways – as a macro language for any program that supports ARexx, as a mediator between applications and as a programming language in its own right. And it's this versatility which puts it in a class of its own.

Before we jump in and start covering application specific routines though, it's important that we take a look at the core commands of ARexx. These commands contain all the usual general purpose commands, functions and constructs that you'll need to piece together some quite powerful ARexx scripts.

Fundamental to all programming languages is the variable, a very clever system which allows you to assign 'pigeon holes' in memory which can be used to store data such as numbers, letters and even complete strings. Unlike virtually every other programming language under the sun, ARexx' variables are what are known as 'typeless'. That is, they're not just restricted to holding one particular type of data (strings, for example). This is a very important aspect of ARexx that makes it very flexible although sometimes rather confusing. To illustrate typelessness, let's take a look at how BASIC handles variables.

In any other program language, the variables you wish to use must follow strict conventions that define both the name and the type of variable. Most programming languages are pretty flexible with naming conventions, but they all insist that the 'type' of each and every variable is defined. In the case of BASIC, a dollar symbol must be appended to the end of a variable if you wish it to hold a string of characters, a percentage symbol for whole numbers (integers) and so on. OK, this is pretty straightforward so far, but what happens if you try to store a string of characters in an integer variable? BASIC would think about it for a while, fall over and then complain bitterly by throwing up some obscure error message such as 'Illegal Type Combination at Line nnn'.

ARexx is somewhat different though. Because its variables are 'typeless', it's perfectly possible to use the same variable to hold many types of data. Depending upon the type of data that you pass to the variable, its type class is defined for you. So it is perfectly possible to change the type class of a variable many times simply by passing data to that variable in different ways. For example, if you had a variable called 'AMIGA' and you passed 1.34 to it, ARexx would treat the variable as a number variable. If later on in your script you passed "SHOPPER" to it, ARexx would then treat it as a string variable. What's more, ARexx is pretty flexible with numbers stored as strings. If you were to try an expression such as "6.0"+6 BASIC, you'd get error message. If you tried this in ARexx, you'd get 12.0.

Defining variables within an ARexx script is very simple indeed. This can be done at any time within an ARexx script, so you can start using a new variable whenever you want without having to check to make sure you've defined it first. Like BASIC, you simply define a variable using the age-old format <Variable name> = <Value>. For example, 'name = "Jason"' and 'age = 22' are both legal variable definitions. Alternatively, you can just start using a variable within a command without even defining it – 'Pull surname', for example, ('Pull' being the ARexx command and 'surname' the name of the variable).

YOUR FIRST PROGRAM

Now that we understand ARexx variables, we can start coding. Install ARexx by booting up Workbench 2.0 and then clicking on the RexxMast icon (if ARexx isn't already installed by your StartUp-Sequence). Next, open up a Shell window, load up your favourite text editor (or simply use the standard AmigaDOS 'Ed' editor) and enter this ARexx script:

```
/*

Say and Pull demonstration

*/

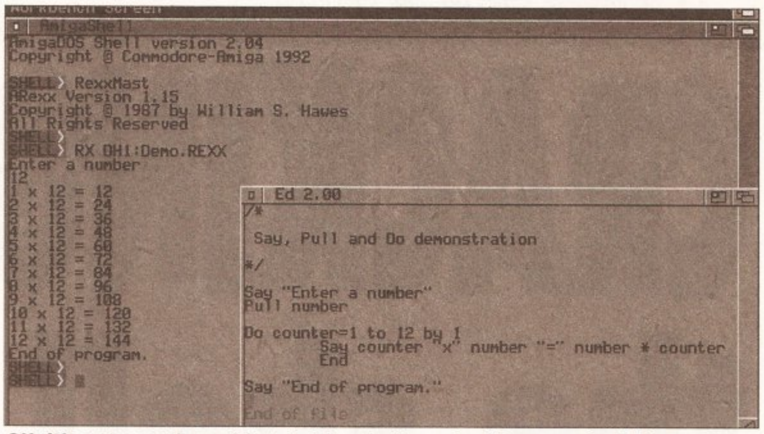
Say "What's your name? "
Pull name
Say "Hello there" name
```

Once you've typed it all in, save it off to disk under the filename 'RAM:Test.REXX', go back to the Shell and type 'RX RAM:Test.REXX'. And – as if by magic – your ARexx program will start to run. Just enter your name when prompted, press RETURN and eh voilà! Your first ARexx program is now complete. Now that wasn't at all painful, was it!

OK, so that was hardly a particularly impressive example of ARexx in action, but it does serve our purposes perfectly. Let's take a look

at it line by line. If you've ever programmed in C, then you'll recognise instantly the strange '/*' and '*/' symbols that appear at the top and directly below the comment 'My First ARexx Script'. As in C, these strange symbols are actually markers that separate comments from the rest of the ARexx script (a bit like the REM statement in BASIC). The first '/*' marks the start of the comment and the second '*/' marks the end (note that the second is reversed though).

One thing that you should know is that unlike other languages, ARexx insists that all scripts start with a comment. If you just entered the last three lines of the example code above, ARexx would throw up the error message 'Command returned 5/1: Program not found'. This is exactly the same error message you'd get if you entered the filename for RX to execute incorrectly. A little



OK, it's not exactly exciting, but here's the output from our first ARexx program in all its glory

confusing maybe, but at least you now know what could be causing it. As a rule then, always start your ARexx scripts with a comment. Simple really.

Next we move onto the 'Say' command which is basically the ARexx equivalent of BASIC's 'Print' command. Like Print, Say is a pretty flexible beast that can be used to not only print text strings, but also the values of variables and it can even print the result of combining variables. The syntax of the Say command is almost exactly the same as its BASIC equivalent – Say <parameters>.

Finally we have the 'Pull' command which is used to get an input from the user – just like the 'Input' command in BASIC. Once you've typed in and run the example program above, you may notice that even if you enter your name in lower case letters or a combination of upper and lower case, the Pull command automatically converts the string to upper case, resulting in some rather odd-looking output. To get around this, you can use the 'Parse' command. Just edit the line containing the 'Pull' statement so that it reads 'Parse Pull name'. Don't worry too much about Parse for the meantime – we'll be covering it in quite some detail in a future issue.

Right, you now know how to get an input from the user, how to display various items of data on the screen and how to store values in variables. Before we go any further though, here's another ARexx program for you to type in which demonstrates both 'Pull' and 'Say' in action.

```
/*

Say, Pull and Do
demonstration

*/

Say "Enter a number"
Pull number

Do counter=1 to 12 by 1
   Say counter "x" number "="
number * counter
   End

Say "End of program."
```

Oops! Without even knowing it, I've unwittingly introduced a couple of extra new commands – Do and End. If you've ever done any programming before, you'll probably already have spotted that this is actually our old friend the 'For...Next' loop. Ok, it looks a bit different from its BASIC equivalent, but it's still essentially the same construct. To make it a little easier to understand, here's that same program in BASIC.

```
Print "Enter a number"
Input number

For counter = 1 to 12 Step 1
   Print counter;" x
";number;" = ";number *
counter
Next counter

Print "End of program."
```

As you can see, the 'Do' line shares virtually the same syntax as its BASIC equivalent. The only real difference is the 'by' option which replaces BASIC's 'Step'. The 'End' command marks the end of the code which is contained within the loop – a bit like the 'Next' command in BASIC. Do...End isn't just another form of BASIC's For...Next construct though. It can also be used for conditional loops, unconditional loops and even infinite loops. Here's a rundown of the commonest forms.

DO FOREVER – Loops continuously until the user breaks out of the program or the program breaks the loop itself using the 'Leave' command (once again, we'll be covering the Leave command in a future issue).

DO <Count> – Performs the loop <count> times. For example, 'Do 20' would force the loop to be performed twenty times.

DO UNTIL <Test> – Same as the Repeat...Until construct in BASIC. Performs the look until <test> is true.

DO Variable=<Start> TO <Limit> BY <Step> UNTIL <Test> – Probably one of the most powerful forms of the Do...End construct, it offers all the functionability of BASIC's For... Next and Repeat... Until constructs all rolled into one. It's very simple but very complex to explain, so here's another snippet code which shows this form of the Do command in action.

```
/*

Complex Do construct
demonstration
Loops until counter equals
input or until counter
equals 20.

*/

Say "Enter a number"
Pull number

Do counter = 1 To 20 By 1
Until counter = number
   Say "Amiga Shopper ARexx
column"
   End

Say "Looped" counter "times."
```

OPERATORS

Here's a list of all the operators that ARexx understands. These are used to perform tests and operations on two or more items or data.

Logical Operators

~ Logical NOT
& Logical AND
| Logical Inclusive OR
&& Logical exclusive OR

Arithmetic Operators

\+ Addition
– Subtraction
* Multiplication
/ Division
% Integer Division
// Remainder
** Exponentation

Concatenation Operators

|| Concatenation
(Blank) Blank concatenation

Comparision Operators

== Exact equality
~== Exact inequality
= Equal to
~= Not equal to
< Less than
<= Less than or equal to
~< Same as '>='
~> Same as '<='

NEXT MONTH

Believe it or not, but we've actually covered quite a bit this month. You should now be able to write ARexx scripts that can take input from the user, print things on the screen, perform loops and test conditions. This knowledge alone is more than enough to write some interesting programs.

Next month we'll be taking a look at even more ARexx commands including the SELECT...WHILE construct and the Nested IF construct. If you start to feel that any particular aspect of this series confuses you, then feel free to write to me at the normal Amiga Shopper address. If the problem seems common, I'll be more than happy to back track a little to clear up any problems that you may be having. See you next month!

CRACKING the shell

In the second part of this ARexx special, Mark Smiddy explains how to generate machine code programs you can send over a FAX terminal

I can imagine a few people thought I had gone completely round the bend by returning to the good-ol'-days with a nostalgic visit to hex dumps. Anyone who can remember that far back will also remember, hex dumps used to be difficult to use. Some programs required you to enter each line "live" and the code would often be several thousand bytes in length; often without a checksum.

Time has marched quickly on and the hex dump, like all good ideas, can still find a use – provided it is brought up to date.

Last month I described an ARexx hex compiler which takes pre-edited hex and compiles it as a program. This approach is much simpler and far more friendly than any other because it allows you to take a break at any point and a mistake is not necessarily fatal.

To complete this two-parter, I'd like to introduce you to another use for hex dumps – electronic transmission. Some BBS systems only support text (7-bit) protocols. It is therefore impossible to transmit a binary file over them. And how could you send a machine code program to a friend using a FAX? These are just two places where a hex dump is the only solution.

Consider sending the source code – surely this must be shorter. In practice, a hex dump can actually work out slightly smaller than the original source it replaces. Especially if the code is heavily commented or written in C for instance. As an example the original source of ISTOO, with only a few short comments ran to 297 bytes – whereas the GENSUM hex coded version runs to just 246! The actual saving is impossible to quantify for any particular case, but hex dumps are often more efficient than a casual glance might suggest.

The binary to SmidHEX conversion is completed in two stages. First, the file is dumped in hex by AmigaDOS then an ARexx program is used to convert that into a usable hex file. Experts can do the first part of the conversion manually, but the AmigaDOS script, Hexify, has been provided to make things that bit simpler. AmigaDOS is used to parse the binary file into hex first because it's much faster than an equivalent program written in ARexx. The second part of the conversion is performed in ARexx for just the opposite reason!

COMPRESSION

I have included two cut-down ARexx versions of the hex-to-binary and DOShex-to-hex conversions which neither generate nor require checksums. These can be used in place of the checksumming versions when you are transmitting 7-bit code over a modem for example; the hex code generated is shorter by 5 bytes

HEX COMPRESSION

Compressing a hex file is not as daft as it sounds – but it is quite tricky since the output file must still be made up of 7-bit ASCII data – around 127 characters in all. The compression technique used here only uses about 30 of the most common sub-strings found in typical AmigaDOS (68000) code – but it can be extended to use more. As it is, the compression ratio rates at between 30 and 40 per cent typically – which is quite acceptable for a compressor written in a DOS language.

Typically the hex dump for ISTOO (described last month) compresses from 246 to 153 bytes – here's what it looks like:

```
1. d3F3 a b1 a 07B4
2. a bD d3E9 bD 11EA
3. 43IN26 7025f b4 izD8 3u3
4. 4A806604 7N5k 2240f b4 4CB1
5. iy62 7Mk 646L32E 6C6962q 7779
6. 61q79N d3F2 8570
```

Entering such code manually would be extremely tricky since upper and lower case code is significant. However, this is highly suitable for transmission down the wires.

Using the compressors is very easy. First enter the compression macros COMPRESS.MAC and UNCOMPRESS.MAC and save them in the S: directory. Now when you want to compress a hex file, simply call edit like this:

```
1>EDIT ISTOO.HEX WITH ↲
S:COMPRESS.MAC VER=NIL:
```

Decompression works in the same way. You can add the compression /decompression to the Hexify and UnHex scripts if you wish: but remember: compress *after* generating the hex-checksummed code and decompress *before* regenerating the binary file.

UN-HEX

Usage: `[EXECUTE] UNHEX INFILE/A, OUTFILE/A`

Examples:

```
1>execute UnHex RAM:ISTOO.SMHX C:
1>execute UnHex ISTOO
```

Essentially UnHex is exactly the same as Hexify, only in reverse. It takes a SmidHEX file and converts that into an executable using the ARexx script Hex2Bin.

This support script makes handling the ARexx programs a little easier because it appends ".HEX" to the source (input) file and saves it in the same path as an executable. The listing appears below and no further description should be necessary.

```
.key infile/a,outfile
.def outfile <infile>
echo "Converting SmidHex <infile>.hex -> binary ↲
<outfile>"
RX Hex2Bin <InFile>.hex <OutFile>
```

JARGON BUSTING • JARGON BUSTING

ARexx – The Amiga version of the IBM Rexx language invented by Mike Cowlishaw and converted by William Hawes. ARexx is an interpreted scripting language used mainly to control other applications. Perhaps the best example is *Professional Page* from Gold Disk.

Assembly language – Often (wrongly) referred to as machine code. Assembly language is a series of mnemonic instructions translated into true machine code by an assembler. The code generated by an assembler executes at extremely high speed and is usually more compact than that produced by any conventional method. It is much harder to use and more prone to errors than other (high-level) languages such as BASIC and C.

LVO – Library Variable Offset. The Amiga's ROM operating system, Kickstart contains hundreds of little routines to control the system. These are referenced by adding a base address (called a library base) to the variable offset. The fact these variables are negative isn't really vital.

Machine code – The series of numbers understood and executed by the 68000. Very few people actually program in true machine code, although it can be done. This technique is usually referred to as hand-coding.

LISTINGS • LISTINGS • LISTINGS • LISTINGS • LISTINGS

Listing 1: HEXIFY

```
.key infile/a,outfile
.def outfile <infile>
echo "Converting binary <infile> -> ↵
SmidHex <outfile>.hex"
type >T:<infile>$$ <infile> hex
rx gensum T:<infile>$$ <outfile>.hex
```

Listing 2: GENSUM.REXX

```
1. /*REXX Convert HEXdump to hex with ↵
checksum */
2. arg com
3. infile = word(com,1)
4. outfile = word(com,2)
5. if outfile == "" then do
6. say "Arguments not suitable for ↵
key - RX GENSUM INFILE/a OUTFILE/a"
7. exit 20
8. end
9. if ~exists(infile) then do
10. say "Fatal - source file" infile ↵
"not found."
11. exit 20
12. end
13. say "Converting: " infile "->"
outfile
14. open('hexin',infile,'r')
15. open('hexout',outfile,w)
16. sum = 0
17. do while ~eof('hexin')
18. hexline=readln('hexin')
19. hexline=substr(hexline,7,36)
20. do X=1 to words(hexline)
21. long=word(hexline,X)
22. do Y=1 to 8 by 2
23. sum=sum + ↵
(x2d(substr(long,Y,2)))*(Y+X)
24. end
25. end
26. if ~eof('hexin') then do
27. writeln('hexout',hexline||d2x(sum,4))
28. end
29. end
30. close ('hexout')
31. close ('hexin')
```

Listing 3: Hex2BinE.REXX

```
/*REXX convert HEX to executable */
arg com
infile = word(com,1)
outfile = word(com,2)
if ~exists(infile) then do
say "Fatal - source file" infile "not ↵
found."
exit 20
end
say "Converting: " infile "->" outfile
open('hexin',infile,'r')
open('prog',outfile,w)
do while ~eof('hexin')
call writech(STDOUT,".")
hexline=readln('hexin')
do X=1 to words(hexline)
long=word(hexline,X)
do Y=1 to 8 by 2
writech('prog',x2c(substr(long,Y,2)))
end
end
```

each line.

The hex-to-binary conversion program can be used to translate manually edited hex dumps (provided the checksum is left off) – but don't do it since it's all to easy to make an error which could crash the machine.

For people using those systems, a hex compression/decompression system has been included which offers on average 30-40 per cent compression of hex code generated by the ARexx programs.

These programs are actually EDIT macros which replace common sub-strings in the hex code! An example of the code generated by the EDIT compresser is also listed.

> **"...hex dumps are often more efficient than a casual glance might suggest"**

HOW IT WORKS:

Hexify

Calling Hexify could not be easier. All you have do is supply the name (without a path) of the file to be converted (optionally with a destination file and pathname) and the script does the rest.

Typically it might be called like this:

Usage: `[EXECUTE] HEXIFY INFILE/A,OUTFILE`

```
1>execute hexify istoo ↵
RAM:IsToo
1>execute hexify istoo
```

The extension ".HEX" will be appended to the name to identify the file. (If you don't supply a destination, Hexify will automatically choose the name supplied and use that as the destination path and filename.) The input file must be in the current directory.

Here's how it all works:

1. Defines the key argument template. Hexify takes two arguments – the input file which must be supplied and the optional output file.

2. If an output file is not supplied, this takes care of it by setting the variable "outfile" to the contents of "infile".

3. Displays a status message. This line is optional and can be omitted if desired.

4. Converts the binary input file to a simple hexadecimal/ASCII dump. This is sent to the T assignment in the RAM disk for speed and convenience.

The <$$> adds the process number and allows the script to multi-task if you desire.

5. Calls GenSum (described below) and converts the AmigaDOS hex dump into a shortened version with line checksums. Note this line adds the extension ".hex" to the output filename. You can change this to another extension if you desire – but do not omit it altogether or you will overwrite the existing binary.

HOW IT WORKS:

Gensum.REXX

Gensum takes an AmigaDOS TYPEd hex dump and converts that into a hex dump with a checksum.

There are two ways of using this program – either call it directly or use the Hexify script described above. The automatic variant is preferable for speed, but if you want to call it manually you can do so thus:

```
RX GENSUM Input file ↵
Output file
```

Typically a call will look something like this:

```
1>TYPE C:list RAM:list.hex
1>RX GENSUM list.hex list.sex
```

Using the program in this way gives you the advantage of choosing the name and position of the temporary workfile and the file extensions – there is little benefit in practice. In fact, TYPE could be called from the ARexx script, but has been left separate because AmigaDOS handles the argument templates with less fuss.

GENSUM is very similar to HEX2BIN described last month, so the following description is not as detailed; refer to the original code for more information.

1. All ARexx scripts must start with a comment line. This is a feature of the language which cannot be avoided and therefore should be used to describe what a program does. This facility can be put to good use if you start all your initial comments with the same string: "/*REXX" perhaps.

Now a simple AmigaDOS command will give descriptions of all your ARexx programs, viz:

```
1>SEARCH REXX:#?.REXX ↵
/*REXX NONUM
gensum.rexx
/*REXX Convert HEXdump ↵
to hex with checksum */
hex2bin.rexx
/*REXX Convert HEX to ↵
executable with checksum */
```

LISTING 4 • LISTING 4

```
/*REXX: covert input DOS ↵
HEX to general HEX */
arg com
infile = word(com,1)
outfile = word(com,2)
if ~exists(infile) then do
say "Fatal - source file" ↵
infile "not found."
exit 20
end
say "Converting: " infile ↵
"->" outfile
open('hexin',infile,'r')
open('hexout',outfile,w)
do while ~eof('hexin')
hexline=readln('hexin')
hexline=substr(hexline,7,36)
if ~eof('hexin') then do
writeln('hexout',hexline)
end
end
close ('hexout')
close ('hexin')
```

LISTING 5 • LISTING 5 • LISTING 5

Compress.MAC

```
ge/00000000/a/
ge/0000000/b/
ge/000000/c/
ge/00000/d/
ge/0000/e/
ge/2C79/f/
ge/41FA/g/
ge/4EB9/h/
ge/4EAE/i/
tl
rewind
cg
ge/4EBA/j/
ge/4E75/k/
ge/41ED/l/
ge/43ED/m/
ge/4AAB/n/
ge/4AAD/o/
ge/4AAB/p/
ge/72/q/
ge/74/r/
tl
rewind
cg
ge/76/s/
ge/78/t/
ge/7A/u/
ge/7C/v/
ge/7E/w/
ge/FF/x/
ge/FE/y/
ge/FD/z/
ge/FC/G/
ge/FB/H/
tl
rewind
cg
ge/FA/I/
ge/F9/J/
ge/F8/K/
ge/F7/L/
ge/000/M/
ge/00/N/
rewind
tl
```

2. Takes the argument line and stores it in the variable, "com".

3. Removes (parses) the first word from the command line and stores it in the variable "infile".

4. Stores the second argument in "outfile".

5. Both arguments are required for this script so this line checks if the last argument was a null (empty) string. If it is control continues at Step 6, otherwise it jumps to Step 8.

> **DON'T TYPE THEM IN!**
>
> **Due to the width of the columns in *Amiga Shopper*, we have to break a listing across two or more columns from time to time. When this happens and you have to enter two or more lines without a [Return] between them, we've used this symbol: ⌟**

6. Provides an error message with command line help and...

7. ...exits cleanly back to AmigaDOS with an error.

8. Terminates the IF...DO block opened at Step 5.

9. Checks for the presence of the input file. If the specified file is missing, control continues at Step 10 otherwise it resumes at Step 12.

10. Displays the file missing error message...

11. ...and returns failure to AmigaDOS.

12. Terminates the IF...DO block opened at Step 9.

13. Everything has gone to plan, so this displays the program's opening progress message.

14. Opens the specified input file for read access (r) with the handle HEXIN.

15. Opens the specified output file for write access (w) with the handle HEXOUT.

If the file cannot be opened for some reason ARexx will fail with its own error message. An existing file will be overwritten unless it has been protected against deletion.

16. Sets the cumulative checksum variable, SUM to its initial value.

17. Starts the main loop which will keep running until the end of the input (source) file is reached.

18. Reads a single line from the input file into the variable hexline. Typically this might look something like this:

```
 -O-       -L-       -L-
0000: 000003F3 00000000

   -L-        -L-  ---A---
00000001 00000000 ....ó.........
```

O = Offset from start of file.
L = One longword of binary data.
A = 16 characters. Non-printing characters are shown as periods.

19. Removes the unwanted data (offset and ASCII) from the line of hex.

This trims the example above into something like this:

```
  -L-      -L-      -L-      -L-
000003F3 00000000 00000001 00000000
```

L = One longword of binary data.

20. Determines the number of words in the variable hexline and sets up a loop to increment X start from 1 to that number. This has to be done because the last line of data can have between one and four longwords worth of hex.

21. Extracts one word of data from the string in Hexline and stores that in "long". The word selected is dependent on the value of X which is controlled by the loop.

22. Sets up a loop which will position Y at 4 Steps through the word (actually its a HEXed longword). Y is incremented by 2 each loop.

23. Calculates the cumulative checksum.

24. Closes the DO loop opened at Step 22 and increments Y. If Y has passed its fence limit, control continues at Step 25 – if not control returns to Step 23.

25. Closes the DO loop opened at Step 20 and increments X. If X has passed its fence limit, control continues at Step 26 – if not control returns to Step 20.

26. Checks the end of input file has not been reached and if not execution continues at Step 27, otherwise it jumps to Step 28.

27. Concatenates the current line of hex with a four-byte, hex-converted version of the checksum value and stores that in the output file, HEXOUT.

28. Terminates the IF...DO block opened at Step 26.

29. Closes the main DO loop opened at Step 17. This loop executes once for each line in the input file.

30-31. Close all the open files and return to AmigaDOS. AS

> **Gotta Problem John?**
>
> **If you get stuck with AmigaDOS or there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, Amiga Shopper, 30 Monmouth St, BATH, BA1 2BW. Sorry, no personal correspondence can be entered into. Desperate people, with no regard for telephone bills, can EMail me on CIX "SMIDOID".**

LISTING 6 • LISTING 6 • LISTING 6

UnCompress.MAC

```
ge/a/00000000/
ge/b/0000000/
ge/c/000000/
ge/d/00000/
ge/e/0000/
ge/f/2C79/
ge/g/41FA/
ge/h/4EB9/
ge/i/4EAE/
tl
rewind
cg
ge/j/4EBA/
ge/k/4E75/
ge/l/41ED/
ge/m/43ED/
ge/n/4AAB/
ge/o/4AAD/
ge/o/4AAB/
ge/q/72/
ge/r/74/
tl
rewind
cg
ge/s/76/
ge/t/78/
ge/u/7A/
ge/v/7C/
ge/w/7E/
ge/x/FF/
ge/y/FE/
ge/z/FD/
ge/G/FC/
ge/H/FB/
tl
rewind
cg
ge/I/FA
ge/J/F9
ge/K/F8
ge/L/F7
ge/M/000
ge/N/00
rewind
tl
```

PHOENIX

A Warm Welcome to Christmas '92

Welcome to our three page Christmas-Special which has all the products you need to make this a "Happy Amiga Christmas!"

Page one is devoted to 'Options', packs which are designed to take the headache out of your choice this Christmas. All year we have been gathering regular feedback from our customers on what they think are the essential items to be found in a pack. From this information we have assembled what we and the Amiga buying public believe to be the ultimate in packs at unquestionably the best prices.

Make 'Options' your only option this Christmas!



James Millard
Managing Director

Sales 0532-311932

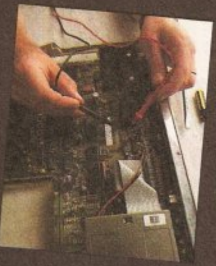
Our friendly, highly trained sales team will ensure that your order is dealt with efficiently and with the minimum of fuss.



At the time of placing your order we will advise you of anticipated delivery time and answer any other queries you may have regarding your purchase. All major credit cards accepted.

Technical Support

The Phoenix product helpline ensures that all our customers benefit from the highest level of after sales technical support.



We also offer advice to help you in choosing exactly the right product for your requirements thus eliminating the possibility of an unwanted or unnecessary purchase.

Despatch 0532-310796

Once you have made the decision to purchase from Phoenix your order will be dispatched promptly and without fuss.



Using one of the countries leading courier services ensures that your goods arrive on time, intact and in the same condition they left our stock.

OPTION 1

ARCADE ACTION PACK

This Pack, built around the A600 1Mb machine, will provide you with everything you need to create your own in house' all-action arcade environment. Exploit the Amiga as the ultimate games machine!!!





NORMAL R.R.P. inc VAT............ £604.85

PHOENIX OPTION 1 £539.99

WHAT YOU GET!

- A600 1Mb
- Phillips Monitor 8833 MkII
- 10 Capacity Disk Box
- 10 Phoenix Bulk Disks with Labels
- Two Joysticks (fully microswitched)
- Mouse-Joystick Switch
- Phoenix Stereo Hi-Fi Sound Speakers
- ZOOL Software Pack (10 High Quality Games inc. ZOOL, striker)
- 8mm Mouse Mat

OPTION 2

HOME OFFICE

This pack is based round the A600 HD giving you all the advantages of an electronic office environ-ment in the comfort of your own home. Alongside the A600 HD, Phoenix also provide you with a top selling 9 PIN dot matrix colour printer, a highly rated software package - rated 84% in Amiga Format - our own Phoenix Deluxe drive, and a full range of top quality accessories, making day to day household management easy!!



NORMAL R.R.P. inc VAT............ £986.85

PHOENIX OPTION 2 £939.99

WHAT YOU GET!

- A600 1Mb (20Mb HD)
- Phillips Monitor 8833 MkII
- Star LC100 9 PIN Colour Printer
- 3.5" External Drive
- PA 601 RAM Expansion
- Europress "Mini Office"
- 10 TDK 3.5" Disks
- A4 Copy Holder
- Anti-Glare screen
- 500 sheets of Paper
- 8m Mouse Mat

OPTION 3

FAMILY PACK

Based on Commodores Epic•Language pack, Option 3 gives the whole family maximum use of the Amiga.



Phoenix have added to the top quality software titles already in the pack with a choice of fun school titles for the children and Monkey Island 2, (Amiga Format Gold winner). They complete what is an unbeatable software based pack. Whether it's word processing, learning, home accounts or just good old game playing, the FAMILY PACK is all you need.

NORMAL R.R.P. inc VAT............ £1006.86

PHOENIX OPTION 3 £929.99

WHAT YOU GET!

- A600 1Mb Epic/Language pack (20Mb Hard Drive)
- Phillips Monitor 8833 MkII
- Star LC100 9 PIN Colour Printer
- PA 601 1 Mb RAM Expansion
- Fun School 3+4 Monkey Island 2
- 50 Capacity Disk Box
- 10 Phoenix Bulk Disks with Labels
- Joystick (fully microswitched)
- 8mm Mouse Mat

OPTION 4

CHRISTMAS CRACKER

"Unbelievable", "Crazy", are just some of the quotes from the industry regarding the demise of the A500+.



Destined never to be sold again the A500+ was superceded by the A600 range. However, Phoenix have secured one of the largest stocks in the UK of the Cartoon Classics Pack and offer you the very last chance to purchase this legendary machine!!

PHOENIX OPTION 4 £279.99

A 500+ Cartoon Classics 2Mb...................... £314.99

WHAT YOU GET!

- A500+
- 1Mb of RAM expandable to 10Mb
- Workbench 2.04
- Real-Time Battery Backed Clock
- Full Comprehensive Manual Set
- Mouse
- TV Modulator
- External PSU
- Lemmings
- Captain Planet
- The Simpsons
- Deluxe Paint III

WHY OPTIONS

- **ALL PRODUCTS** are full UK spec.
- **ALL PACKS** supplied with full connecting cables for immediate operation.
- **FREE** 'Getting Started' technical guide.
- **FREE RETURN TO PHOENIX** pick-up on all faulty hardware within 30 days of purchase.
- **FREE UK DELIVERY**- on all 'Options' packs
- **FREE DUST COVERS** for Computer, printer and monitor when purchasing an options pack.
- **EXCLUSIVE** technical helpline number.
- **THE KNOWLEDGE** that you are purchasing from one of the premier mail order companies in Europe.

If you wish to upgrade any major item of hardware in the 'Option Pack', simply tell us at the time of ordering and we will just charge you the difference in price between the two products. Easy!

SPECIAL CHRISTMAS OPENING TIMES

Mon-Sat 9.00-7.30

PHOENIX

A 600 NEW PACKS

'THE WILD, THE WEIRD & THE WICKED'

1 Mb A 600 as standard and includes the excellent value Software titles: Deluxe Paint III • Formula One Grand Prix • Putty • Pushover

...ONLY £339.99!

A 600 2Mb (incl. above software)........£379.99

'EPIC • LANGUAGE PACK'

1 Mb A 600 as standard and includes **20MB HARD DRIVE** the excellent value Software titles: Deluxe Paint III • Trivial Pursuit • Epic • Myth • Rome

...ONLY £484.99!

A 600 2Mb+20 Mb Hard Drive £524.99

(both include the above detailed software)

A 600



The stand-alone A 600 is compact, semi portable, fully featured and can be purchased in the following configurations:

A 600 .... £274.99

A 600 HD ..... NOW ONLY £429.99

A 600 2Mb £314.99

A 600 HD 2Mb £469.99

RAM EXPANSION A 600

FEATURES INCLUDE: - Trapdoor installation Will not invalidate your warranty • Battery backed real time clock • Long life lithium cell • Enable/disable facility • Full installation instructions • Made in U.K. • Complete with famous Phoenix 2 year warranty.

Phoenix PA 601-populated-1Mb.....£44.99

Phoenix PA 601-unpopulated-0Mb...£24.99

Phoenix A 600 ROM Sharer...........£29.99

Keyboard switchable!

Phoenix PA 6020-2Mb Smartcard..£119.99

Phoenix PA 6040-4Mb Smartcard..£149.99

A 4000 AMIGA 4000

Features Include: 68040 32 Bit Processor running at 25 MHz (upgradable) • New Double AA chipset with 16.8 million colours • high density 1.44 Mb floppy • 120 Nb IDE hard drive • New Workbench 3

AMIGA 4000.................... £2,229.00

A 4000 with 40Mb Hard Drive............£P.O.A.

A 4000 with 240Mb Hard Drive..........£P.O.A.

A 4000 with 425Mb Hard Drive..........£P.O.A.

Please note that a SCSI II 4000 controller will be available from mid November-Call sales for details and price.

1500 AMIGA 1500

2.04 Workbench Includes: Deluxe Paint 3, Platinum Works, Home Accounts, Toki, Puzznic, x Elf, Amiga Format Book and Joystick

AMIGA 1500............... ONLY £539.99

A 500 EMULATORS

GVP PC-286 16MHz....................£239.99

KCS Powerboard (with DOS 4.01).......£199.99

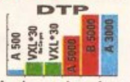
KCS Powerboard £184.99

KCS adaptor for 1500/2000... ONLY £59.99

Vortex A Tonce Plus 286 (16MHz)...£214.99

32 BIT ACCELERATORS (NEW)

The incredible speed of 32-Bit technology at a price you can afford only from S.S.L. Ray tracing an image that takes 24-hrs on a standard Amiga takes just **1 hr. 36 mins.** with an A5000!! **FREE** maths co-pro included with both A/B5000 accelerator cards.



A5000 + 1MB 16.67 Mhz £249.99

A5000 + 2MB 16.67 Mhz £289.99

A5000 + 3MB 16.67 Mhz £319.99

A5000 + 4MB 16.67 Mhz £349.99

B5000 + 1MB 25.00 Mhz £499.99

B5000 + 2MB 25.00 Mhz £669.99

B5000 + 3MB 25.00 Mhz £829.99

B5000 + 4MB 25.00 Mhz £979.99

A 500 HARD DRIVES

GVP IMPACT SERIES II Hard Drives, the fastest Hard Drive/Controller for the Amiga. Features Game Switch, external SCSI port, FAAASTROM SCSI Driver, GVP's custom VLSI chip and internal RAM expansion up to 8 meg! Units use high specification fast-access QUANTUM Hard Drives coming with **2 yr. guarantee.**

A500-HD8+ 52 Mb (Unpopulated)........£329.99

A500-HD8+ 120 Mb (Unpopulated).......£424.99

A500-HD8+ 240 Mb (Unpopulated).......£689.99

DRIVES ROCTEC

SALE OF THE CENTURY!!

Phoenix in association with Roctec and Conner, continue to achieve massive sales on this high specification, quality product. Due to the buying power of Phoenix we are able to maintain these incredible prices-prices that have left the competition GREEN with envy-and the Amiga buying public licking their lips. **Stocks will only last until the end of November.**

ROCTEC 40 MB.......................£259.99

ROCTEC 60 MB.................SOLD OUT!

ROCTEC 85 MB.......................£299.99

ROCTEC 120 MB.....................£364.99

Featuring Connor drives-very fast access times-(19ms or better) • expand up to 8 Mb using 1 Mb Simms only • 1 year guarantee • slimline design ideally colour matched to the A500 • Own power supply.

ROCTEC (controller Only)...............£164.99

Same specification as the above but without the hard drive fitted so you can fit your own. Please specify IDE or SCSI.

EXTRA MEMORY-Only £25.99 per Mb.

HARD DRIVES 1500/2000

Series II Hard Disk Controller/RAM card....£114.99

Series II 52 Mb Hard Disk and RAM card.....£269.99

Series II 120 Mb Hard Disk and RAM card....£399.99

Series II 240 Mb Hard Disk and RAM card....£639.99

EXTRA MEMORY-Only £25.99 per Mb.

A 500 ACCELERATORS

GVP COMBINATION ACCELERATORS & HARD DRIVES-The ultimate expansion product for the Amiga 500!

A530 Combi 40MHz + 52Mb Hard Drive.......£659.99

A530 Combi 40MHz + 120Mb Hard Drive.....£757.99

A530 Combi 40MHz + 240Mb Hard Drive.....£979.99

A530 68882 Co-Processor......................£204.99

FAST ACCELERATORS 1500/2000

GVP G-Force 030-25MHz + 1Mb..............£545.99

GVP G-Force 030-40MHz + 4Mb..............£784.99

GVP G-Force 030-50MHz + 4Mb..............£1099.99

FAST ACCELERATOR RAM Modules

1Mb Simm-32 Bit 60 Nanoseconds........£65.99

4Mb Simm-32 Bit 60 Nanoseconds........£182.99

PC EMULATORS 1500/2000-3000/3000T

Vortex 'GOLDEN GATE' NEW! £419.99

This emulator is the ultimate bridge between PC/AT platforms and the Amiga. If you think this is for you, cross to page three for specification details in this months 'Trail Blazers' section!

IMAGE PRINTERS

STAR

LC-100 Colour.................. NEW! £159.99

9 PIN colour printer with paper parking, eight fonts and electronic DIP switches.

LC24-100 .... NEW! £189.99

24 PIN with compressed data mode, 16 K buffer and 10 letter quality fonts,(with Star printer driver only).

LC-20..................................£129.99

LC-200 Colour.....................£195.99

LC24-20..............................£199.99

LC24-200 Mono £219.99

LC24-200 Colour...................£268.99

XB24-200 Colour...................£379.99

SJ48 Bubblejet......... NOW ONLY £219.99

Star printers come with one year warranty.

CITIZEN

Swift 240 Colour............... NEW! £279.99

Swift 240 Mono................ NEW! £259.99

Swift 200 Colour............... NEW! £219.99

Swift 200 Mono................ NEW! £199.99

Swift 9 Colour........ SPECIAL OFFER £179.99

Citizen printers come with 2 year warranty.

HEWLETT PACKARD

Deskjet 500.............. SPECIAL OFFER £329.99

Deskjet-500 Colour..........................£449.99

HP printers come with 3 year warranty.

HP black ink cartridge £24.99

HP colour ink cartridge £29.99

AUTO SHEET FEEDERS

STAR LC20.................... NOW ONLY £57.99

STAR LC200..£59.99

STAR LC24-200......................................£62.99

STAR LC24-20..£62.99

STAR SJ48...£49.99

"I will recommend Phoenix to my friends with no reservations."

C. A. Squire~ Aldburgh

JET BUBBLE JET

CANON BJ 10eX..................... NEW! £224.99

Upgraded version of BJ10e, the worlds biggest selling portable inkjet printer.

CANON BJ 20......................... NEW! £319.99

More Features than the BJ10, includes Auto sheet feeder. Top selling-Highly Recommended

CANON BJ 300........................ NEW! £374.99

80 column bubblejet provides laser quality output.

CANON BJ 330........................ NEW! £499.99

136 column bubblejet.

CANON Bubblejet cartridges............£17.99

PHOENIX PRINTER PACK

Supplied with **ALL** printers containing 1.8m std. printer cable, printer ribbons/cartridge and 250 sheets of paper absolutely **FREE**.

PRINTER ACCESSORIES

We have a large range of **high quality** printer accessories for all the printers we sell including: **dust covers from £2.99 • Ink cartridges from £13.99 • Mono ribbons from £3.50 • Colour ribbons from £7.99 • Printer stands from £7.99**

SILICON CHIPS

AMIGA CUSTOM CHIPS

Kickstart 2.04 ROM...£34.99

Kickstart 1.3 ROM....£27.99 Fatter Agnus 8372A...£34.99

NEW Super Denise.£29.99 CIA 8520A....................£9.99

MEMORY CHIPS

4 Mb x 9 (-70) Simm.....£99.99 1 Mb x 4 (-80) Zip.....*£34.99

1 Mb x 9 (-80) Simm...£27.99 256k x 4 (-80) Zip.....*£29.99

256k x 9 (-80) Simm...£12.99 1 Mb x 1 DRAM..........£3.49

256k x 4 DRAM...........£3.49 *This price is for 1 Mb of RAM

These chips cover practically every popular memory expansion or Hard Drive system on the market for the Amiga ie. GVP, SUPRA, MICROBOTICS, COMMODORE

"I must write to congratulate you on the efficiency of your mail order staff."

Robert S. Blair ~ Denmark

X-PAND MEMORY EXPANSION

SUPRA 500RX the ultimate in Fast Ram expansion units. *(Uses 256x4 Zips)*

8 Mb pop to 1 Mb*..................................£99.99

8 Mb pop to 2 Mb*..................................£124.99

8 Mb pop to 2 Mb....................................£149.99

8 Mb pop to 4 Mb....................................£209.99

8 Mb pop to 8 Mb £309.99

VISION MONITORS

PHILIPS 8833Mk II........ ONLY £194.99

Colour Stereo Monitor now including **'Lotus Turbo Challenge'**, and 1 years on-site warranty.

COMMODORE 1085 SDI £216.99

COMMODORE 1084 SDI..........£199.99

All monitors are supplied with a FREE cable for connection to your Amiga.

MONITOR ACCESSORIES-

14" Dust covers.................................£4.99

14" Tilt & Swivel stand......................£13.99

Anti-Glare filter screen......................£19.99

A4 Copy Holder..................................£12.99

"This is is the second time I have dealt with you and each time have had excellent service and rapid delivery"

Peter W. Beaumont~ Huddersfield

DISKS MEDIA

Don't confuse these quality disks with others currently available. 3.5" 100% certified error free 70% clip. All disks include **FREE** high quality Phoenix labels.

10.....................£4.99 200......................£72.99

25....................£12.99 500....................£174.99

50....................£22.99 750....................£259.99

100..................£39.99 1000..................£339.99

TDK Branded disks- High performance media from the experts-box 10 with labels.

10....................£5.99 100....................£52.99

50..................£26.99 500..................£249.99

1000 Phoenix Disk Labels.................£9.99

WIRE LEADS & CABLES

Midi-Midi 2m....£3.99 Modulator ext....£9.99

Midi-Midi 3m....£4.99 Amiga-Scart.......£9.99

Midi-Midi 5m....£5.99 Amiga-8833MkII.£9.99

Disk Drive ext....£9.99 Joystick long ext.£4.99

Mouse/Joystick ext..£4.99

Mouse/Joystick splitter.....................................£4.99

*Serial/Modem cables.......................................£9.99

*Amiga-Multisync..................................from£9.99

*Amiga-Microvitec..£9.99

*Amiga-CPC monitor..£9.99

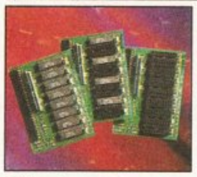
*Amiga-RGB/TV..£9.99

*SCSI Cable various £9.99

Printer 1.8m........£5.99 Printer 2.0m HQ....£7.99

***For full details of these cables or information regarding the right cable for the job call 0532-311684. Custom built leads are no problem Phoenix.**

PHOENIX 2 Meg RAM Upgrade Modules



A PHOENIX RAM module can expand your chip RAM up to 2 Mb by using the trapdoor expansion port. Extra RAM is necessary to unleash the incredible graphics capabilities of your Amiga. All our boards carry a full 2 year no quibble replacement guarantee. **It's never been cheaper to upgrade!**

1 Mb Fully populated RAM board.... NOW ONLY £34.99

1 Mb unpopulated RAM board.........£16.99

VIDEO MULTI-MEDIA

Rombo's Vidi Amiga 12 is the replacement for their complete colour solution bringing you the world's first mass market colour digitiser for **under £100**.

VIDI-AMIGA 12 .... ONLY £79.99

Outstanding features and plenty of **VFM!**-*(Value for money!)*-Highly Recommended.

ROCGEN Plus £129.99

Quality features and performance-Recommended.

ROCKEY BY ROCTEC

The new chroma key unit - used in conjunction with a Genlock - allows you to superimpose live video over graphics or video-substitute the brightness portion of a video source with a keyed image-Embed live video in graphics!

Phoenix Price.........................£269.99

TRAIL BLAZERS-WHAT'S NEW IN NOVEMBER 1992!

In this month's pre-christmas "TRAIL BLAZERS," we focus on some of the best products and peripherals currently on release for the Amiga.

PHOENIX 1Mb A600 UPGRADE



Simply the Best !

...£44.99

ROCTEC ROCLITE

This famous super slim drive has now been upgraded to include Anti-click and virus checker - We have reluctantly had to raise the price of this product due to the variance of the dollar rate. However to soften the blow we will include a FREE disk head cleaner worth £3.99

Phoenix price..........£64.99

VORTEX 'GOLDEN GATE'

Designed for the Amiga 1500/2000/3000 and 3000T this is a 25MHz 80386SX PC/AT Emulator. PC/AT slot support-Max 16 Mb PC/RAM, 4Mb for Amiga-Will use PC/AT IDE Hard Disk and floppy disk drives 2.88 Mb under Amiga DOS, highly recommended.

Phoenix price.........£419.99

FINAL COPY-UK VERSION

This powerful, unique WYSIWYG word processing package is the best value choice for your Amiga, sharing many of the features of full-blown DTP packages

Phoenix price.........£69.99

Be safe in the knowledge that you are buying the official UK version of the product from Phoenix. *BEWARE of dealers offering "Latest version" of Final Copy. This may be American product and should not be sold in the UK!*

AMOS PROFESSIONAL

The most eagerly awaited software package of the year, has just received an award of 97% in CU AMIGA. Francois Lionet's superb creation has now evolved to include numerous new features developed from Amiga users ideas and feedback. Don't miss this six disk Bonanza!

Phoenix price £44.99

OPAL VISION

Amazing new 24-Bit graphics card and video system for the Amiga 1500, 2000 and 3000. Includes software suite worth hundreds of pound. With an incredible performance, this is simply awesome.

Phoenix price.......£739.99

PHOENIX PRODUCTS

Mouse/Joystick Switch.................£13.99
Don't damage your Amiga's ports! This device saves wear and tear makes switchover *FAST*, and does **NOT** require power unlike many others.

Computer/Video Scart Switch....£19.99
Flip between Video/computer signals at the push of a button.

Phoenix Stereo speakers...... NEW! £29.99
Superb sound and excellent dynamics. These two-way stereo Hi-Fi speakers are an Amiga standard-**Excellent companions on any gaming soiree!**

DISK DRIVES 3.5"

All drives feature super slim design, enable-disable switch, thru port and come with a **1 year replacement guarantee!**

Phoenix Deluxe Drive....................£47.99
Roctec Roclite..................... NEW! £64.99
This famous drive has now been upgraded to include Anticlick and Virus Checker
Disk head cleaner..........................£3.99

FREE FAST UK DELIVERY

NEXT-DAY COURIER ONLY £4.50

MUSIC - AMIGA MUSIC

Attention all you music lovers! Phoenix have kept this unbeatable music deal running for you throughout the Christmas period.

MUSIC-X Jnr....only £15.00
When purchasing either a Phoenix Stereo Sampler or Pro Midi 2 Interface
Please Note: this is a limited offer only while stocks last!

Stereo Sampler......... NOW ONLY £29.99
Combines ease of use with state of the art analogue to digital conversion technology.(inc. **FREE** sample editing software +audio lead)

Pro-Midi 2 Interface.....................£24.99
This fully featured professional quality midi interface is very flexible giving semi-patch bay facilities. It has five ports in, out, thru and two switchable out/thru. (inc. **FREE** midi lead)

GVP Digital Sound Studio...........£54.99
High quality sound sampler for all Amiga Computers
Amiga Music Made Easy-Only from Phoenix!

A 570 CD ROM

This essential add-on has finally arrived, suitable for A500/A500+, A570.

Phoenix price... ONLY £329.99

MICE & TRACKBALLS

NAKSHA Upgrade Mouse.............£24.99
(With Operation Stealth, mat & holder)
Roctec Mouse...............................£13.99

GOLDEN IMAGE
Mega Mouse..................................£12.99
(Has just received 90% Amiga Format Gold Award)
Optical Mouse.............................£29.99
High precision, pointing device.
Crystal Trackball..........................£37.99
Infrared-Cordless-Mouse... NEW! £47.99
(Rechargeable top selling innovation.)

Optical Pen Mouse............ NEW! £39.99
High Quality 8mm mouse Mats..........£3.99

IMAGE SCANNERS

Powerful image processing tools for the office or the home environment.

POWER-Features include: 100-400 dpi • 64-Greyscales Thruport to printer • **FREE** Editing software.
Power Scanner v2.0..............£94.99
Power Scanner Colour..............£234.99

GOLDEN IMAGE-Hand Scanner Series
Features: 400 dpi • 256-Greyscale • Touch up and Merge it software.
AlfaScan £124.99
AlfaScan Plus £149.99
AlfaScan OCR *(inc OCR Software)*.....**£279.99**

EPSON GT-6000 FLAT BED FULL COLOUR SCANNER-Plug into Amiga parallel port, 600 d.p.i. resolution, up to 16 million colours
Phoenix Price.....................£989.00

ASDG-SOFTWARE-Scanning software comes in two forms, integrated into art development as a new module or used as a stand-alone programme.
Phoenix Price...................£109.99

ACCESSORIES STUFF

Control Centre.....................................£34.99
Heavy duty construction,rubber edging, perfect colour match, makes an ideal workstation for the A500/A500+ **A 600 control centre now available.**

DATA SWITCHES-*(25 pin D type)*
2 way...£15.99
3 way...£17.99
4 way...£19.99

STORAGE:
90 Capacity BANX..............................£11.99
150 Capacity POSSO...........................£16.99
Disk Box 10 Cap.......................................£1.99
Disk Box 25 Cap.......................................£2.99
Disk Box 50 Cap.......................................£4.99
Disk Box 100 Cap.....................................£6.99
Disk Box 120 Cap.....................................£7.99
Top grade, heavy duty injection moulded boxes. Low cost, high quality.

AMIGA RELEASE 2

Now Only..



£79.99

The popular upgrade kit for 1.2 / 1.3 owners from Commodore is in stock and selling fast!

SOFTWARE

WORD PROCESSING / DTP
- Kindwords 3.................................£36.99
- Final Copy 2 .... NEW! £66.99
- Professional Page 3........... NEW! £129.99
- Saxon Publisher.................. NEW! £189.99
- Pagestream v2.2 ....£126.99
- Pagestream Font pack 1 ....£44.99
- Pen Pal 1.4................. SPECIAL OFFER £39.99
- Prowrite v3.X £57.99
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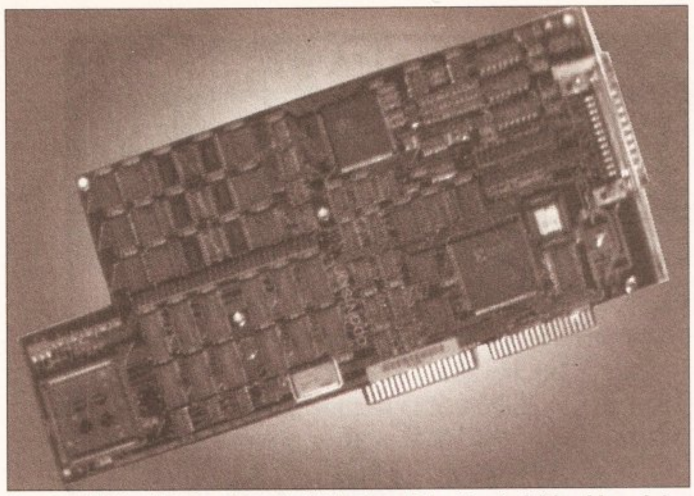


Gary Whiteley samples the spectrum of software which comes with OpalVision – the latest heavy artillery in the Amiga graphics war

With the introduction of DCTV, and of AVideo 24 earlier this year, a price war for quality Amiga graphics devices began. OpalVision looks set to intensify this conflict, with a powerful 24-bit paint program and opportunities for expansion into full video mixing and processing which will surely draw comparisons with NewTek's Video Toaster.

Like the rare gemstones that are its namesake, OpalVision hails from Australia, apparently from the same designers as the ill-fated Colorburst system – which promised so much, but for many reasons ultimately failed to deliver the goods.

Not much fear of OpalVision going the same way though, as it is undoubtedly a world away from its quirky and unsuccessful predecessor.



The OpalVision Mother Board which plugs into the Amiga's video slot



OpalPaint's easy-to-use palette mixer and colour selector keeps everything rosy



The font types which can be used with OpalVision



Gradient fills come in many varied forms with *OpalPaint*

OPALVISION'S TOP NOTCH TECH SPECS

- Mounts in A1500/2000/3000 video slot
- External version to be available for A500/600 Amigas
- 24-bit RGB output
- 1.5Mb display RAM on-board
- Maximum display screen size 768 x 580 (PAL Overscan)
- Max image size 32768 x 32768 pixels using hard drive as virtual memory
- Expansion sockets for frame grabber/genlock, video effects, vision mixer and de-interlacer
- Use OpalVision to display 24-bit backdrops and Amiga software on same screen and genlock or record the output to video.
- Autoconfigures for PAL or NTSC

ONE PIECE AT A TIME

The most interesting aspect of the OpalVision design has got to be its modular concept. The motherboard, which is the core of the OpalVision system, plugs into the video slot of Amiga 1500/2000/3000 computers and connects directly to the Amiga's RGB monitor, external genlock or other RGB device. As they become available, expansion modules can be added to perform a variety of video operations, including digital video effects, vision mixing, frame grabbing, genlocking and de-interlacing. (See the side panel for more details).

Packaged with the OpalVision motherboard is a variety of software, including *OpalPaint* – a full-featured 24-bit paint program, *OpalPresents!* – a sophisticated slide show program, *OpalHotKey* – for displaying Amiga graphics and animations directly over 24-bit graphics, a number of useful utility programs and, wait for it, *King Of Karate*, touted as the world's first 24-bit personal computer game, of which all that really needs to be known is that you need over 5Mb of hard drive space and 2Mb of Chip RAM just to get it running.

QUICK FIT BLISS

Installation is beautifully simple, requiring the OpalVision motherboard to be inserted into the Amiga's video slot, connected to the RGB monitor, and the software installed on to hard disk. By opting not to install the wide range of demo pictures and backgrounds I had the whole thing done in less than twenty minutes – and I didn't even have to fiddle with the adjustment screw on the rear of the board to tune the video signal in, though maybe I was lucky.

OPALPAINT

As is often the case when I'm testing new products, once installation is complete I just jump straight in and start playing. This time I made a beeline for *OpalPaint*, which loaded quickly and presented me with a straightforward looking main menu. I soon found that the basics of *OpalPaint* were very easy to get to grips with, particularly since it duplicates the now almost standard *Deluxe Paint* keyboard shortcuts.

Of the various Amiga 24-bit paint programs I've looked at this year (*MacroPaint*, *TVPaint 1.8* and *DCTV Paint* among others) I reckon this is the best value yet. I was impressed with the sheer range of options, though I eventually had to resort to the well presented manuals in order to understand the finer points of several of the more unfamiliar new functions. Surprisingly, for all its features, *OpalPaint* seems to be very fast on the draw, compared with other programs.

As you would expect, all the usual paint tools are present, as well as some new features which haven't been seen on the Amiga before. There are some notable omissions too, such as perspective scaling for brushes, colour cycling and soft edging. Some functions, such as ARexx, alpha work mode (8-bit masking) and the Magic Wand feature (for cutting out edge-detected areas), weren't working in the release version I received, though the doc files say they're imminent. On the positive side, the omissions are greatly outweighed by the wealth of new features which *OpalPaint* has.



Little gems or soft in the head? The latest Antipodean offerings are from the same stable as the Colorburst system but look more promising

PAINTS, BRUSHES AND PAPER

One such novelty is the expandable range of artists tools which very effectively simulate air brushing, watercolour, crayon, chalk and something called Texta, along with several types of drawing surfaces – including hairy paper, rice paper and hessian – which can be called at any time.

With 240 colours available for immediate use (from a palette of 16.8 million), and the ability to change any of them at any time without affecting the image, palette management could become a bit of a nightmare. Not so with *OpalPaint*, as it has a versatile on-screen colour mixing system which is rather like mixing real oils together on a palette, but without the mess. Colour spreads and individual colours are easily made and both palettes and colours can be named and saved for later recall, and to get you started a small, but useful, range is provided with the software. Switching to a new set of paint pots, as they are termed, is easily done with a mouse click or two.

To keep high quality imaging, anti-aliasing is available for any job, from lettering to brush placement, as well as normal drawing functions, so you can quickly smooth new clips into an existing image and draw with no fear of the jaggies.

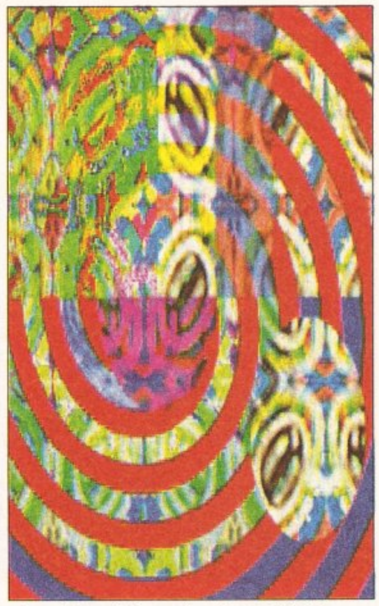
STENCILS

Stencils are used either to protect or expose parts of the image from being affected by painting operations. With *OpalPaint* stencils can be made in two ways. The first is to define a mask stencil which works rather like a traditional artists' frisket in that it temporarily seals off the masked area from any further changes. The second, or colour stencil method, specifies selected colours to be either opaque or transparent to subsequent painting operations – though I use these terms loosely – as colour stencils can also be controlled by a range of colours or tolerance parameters which use brightness, contrast and hue settings to limit or extend their effectiveness. Colours can be included or excluded from use, and both types of stencil can be in use simultaneously. Sadly, stencils cannot yet be saved for reuse, nor have soft edges, though a stencil can be made into a 'Priority Stencil' which is saved with an image to make windows when mixed with Amiga graphics or live video.

BRUSHES

Like all paint programs, a brush can be clipped from a single colour background by using either a stencil or, more simply, by setting the Colour option in the brush requester to reject anything which is the current background colour. But this isn't the only way – as *OpalPaint* has a more elegant approach for use where more complex backgrounds are concerned. By carefully setting tolerance levels it is possible to extract a brush from a gradient filled background, for instance, though this is something of a black art and mastering it does require some experimentation.

Once captured, up to three brushes can be held ready for immediate use, while others can be loaded and saved as usual. Brushes can also be flipped, resized, rotated, stretched and warped into new shapes – everything but perspective. This, like soft-edged pasting, will no doubt appear in future releases.



A quick mixture of colour effects, rubthrough, tiling and sharpen, among the others available

TEXT

OpalPaint can handle all the normal Amiga-supported fonts. This means Amiga fonts, Colorfonts and Outline fonts (under WB2.x). With a choice of 16 million colours Colorfonts no longer hog the palette as they do in *Deluxe Paint*, for example, and they look good too. Sure, direct AGFA Compugraphic (CG) font support

ADD-ON EXTRAS FOR OPALVISION

Four expansion modules are being developed to plug into the OpalVision motherboard. These will be available separately and, when fully loaded, OpalVision should be capable of providing high quality video processing and effects, vision mixing, 24-bit graphics, image grabbing, genlocking and flicker-free multi-sync output. If the price is right, OpalVision could quickly become the PAL-user's add-on to rival to NewTek's Video Toaster, especially if a PAL Toaster is not available within a very short time.

• FRAME GRABBER / GENLOCK

As well as promising instant 24-bit frame grabbing up to broadcast quality, 8-bit level keying (for fine control) and overlaying of both OpalVision and Amiga graphics onto live video, it will also be possible to use this module to do real-time video processing to produce a variety of colourful effects such as false colour, inversions etc.

• ROASTER CHIP

This could well be the component that ends the Video Toaster's reign as the only Amiga-based digital video effects generator. Details are sparse at the moment, but with software for designing and sequencing custom effects and transitions, expandable libraries of wipes, and scalable picture in picture (video on Workbench) it looks like PAL users will finally be getting what they deserve for their favourite Amiga computer.

• FOUR INPUT VISION MIXER

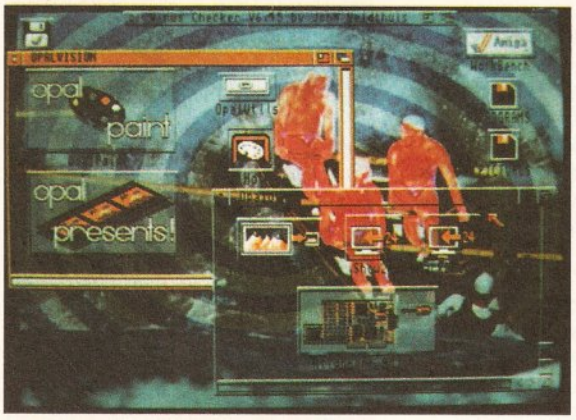
Another parallel development to the Toaster's four input switcher – four video inputs assignable to two channels for mixing and effects, and all inputs will accept either S-Video or composite signals. For slaving the Amiga system to a video suite the mixer has an external sync input, though it's unclear whether each VTR input will require its own time base correction (I suspect they will). There's also an External Key output to feed Alpha channel information to an external vision mixer. Both the Roaster Chip and the Vision Mixer expansions require the Frame Grabber / Genlock module to be present.

• SCAN-RATE CONVERTER

A de-interlacer and frame-buffer to provide flicker-free, rock steady video output to multi-scan and multi-sync monitors for high resolution applications such DTP and 3D modelling.

I've been told to expect these modules to be released around Christmas, but I won't be holding my breath. Nevertheless, if you're listening Santa, I'd like OpalVision and all the trimmings please, even if you can't deliver till Easter!

would be nice, but WB2.x owners can use the Fountain program to convert any of the newly-emerging PD CG-type fonts to work perfectly with *OpalPaint*.



Use OpalVision's HotKey software to put a 24-bit backdrop behind any Amiga screen

MODES

In addition to the standard paint, smear, smooth and colourise-type modes, *OpalPaint* has an extensive collection of other operators (or Modes) which can be sprung on any unwary image. Sharpen, emboss, edge detect, blur – they're all here – along with about 30 others, and doubtless more will be added as time goes by. I'd like to see a Colour Cycling included as it would be great for animated diagrams and psychedelic pop video backgrounds. Where necessary, modes have a 0 to 100% parameter bar which is adjusted to affect the extent of their action – making them even more flexible.

SWEET FILLINGS

If, for some inexplicable reason, you ever get stuck for inspiration, there are lots of ways to fill up those empty spaces – solid colour, warped brushes, tiled brushes or smooth colour gradients being popular. By setting a tolerance value, added control can be made as to exactly *where* the fill will take effect. Colour gradients are easily set and tested before use, and brushes can have their degree of 'warping' set so that they will flow into a space.

RUB THROUGH

Did I mention that *OpalPaint* can run as many screens as your Amiga's memory can support? Not only that, but it's possible to rub through from one screen to another, which means that slick compositing effects can be easily done. Select the screen to rub through from, decide what constraints to use (stencil, transparency, antialiasing etc) and off you go.

In addition to all the above, there are a few extra items which have their own menu bar. Zap Image will affect the whole image with the current settings in one fell swoop, Workbench temporarily shuts down *OpalPaint* to an icon on the workbench screen, Preferences sets up some filing, drawing and memory settings and Page Format controls the current screen size.

PICTURE FORMATS

OpalPaint can handle *all* IFF picture files, including 24-bit and 8-bit. It can also load and save JPEG compressed files and has its own OV-Fast format for speed loading and saving when an accelerator isn't available, though this format isn't otherwise recommended for normal use as it produces large, non-standard, files. All standard screen formats up to 768 x 580 PAL overscan can be used and multiple screens of any size can be open at any time, dependent upon available memory. Images up to 32768 x 32798 pixels can be manipulated because *OpalVision* can use vacant hard drive space as virtual memory.



Transparency, stencils and Modes all played their parts in this composited construction

I made one final acid test – the user trial. I asked both a traditional artist unfamiliar with computers and a video artist familiar with Amigas and other computers to try *OpalPaint*. The verdict was unanimous – *brilliant* – and who am I to disagree? The best fun I've had for ages.

OPALPRESENTS!

My initial impressions on seeing *OpalPresents!* was that it was a very smartly presented, high class slide show. It has 20 transitions, including some very smooth and impressive effects, adjustable display and transition lengths, ability to load any OpalVision compatible image and prioritise the display screens, meaning that the order in which OpalVision, Amiga and Live video (when the genlock is available) layers are displayed. *OpalPresents!* can be driven by mouse, ARexx or timer settings. The bad news was that my Amiga hung quite often whilst using *OpalPresents!* . Only a reboot could restore the system. Still, at least the presentation script can be saved. As I first thought – a posh slide show.

OPALHOTKEY

When *OpalHotKey* is running in the background it can be used to control the various settings of the OpalVision system by using a selection of function keys and ALT-CTRL-SHIFT simultaneously. It can also be addressed by ARexx (and this one *is* working), so either manual or remote control of 24-bit background images, screen priorities (Amiga/OpalVision/Live Video) and stencil settings can be attained. So Amiga screens can appear in front of OpalVision images, and simultaneously have a stencil applied to give priority to selected screen areas. Sounds complicated but it still looks pretty cool.

LITTLE HELPERS

A number of utility programs are also included, most of which perform small, but often essential, tasks:

• *Backdrop24* – loads any image which OpalVision can display as a backdrop.

• *Show24* – shows images by selecting them from their icons.

• *MakeThumbnails* – checks for IFF files and makes (or deletes) thumbnails for them as required.

• *Convert 24* – a CLI utility to convert to and from IFF, OV-FAST and JPEG formats simply and quickly.

REQUIREMENTS

High quality graphics are very demanding on any computer system. OpalVision is not alone in requiring at least 1Mb Chip RAM, 4Mb of Fast RAM and a 40Mb+ hard drive. Although it can work with a standard 68000 CPU, an accelerated version would be far superior. WB2.x is recommended, and 2Mb of Chip RAM will ensure that *OpalPaint* can open a full hi-res work screen, rather than a truncated one such as I was experiencing. OpalVision can also use the WACOM pressure-sensitive graphics tablet.

CONCLUSION

OpalVision is an ambitious and innovatory idea. Some rough edges need smoothing down, but as a first version it has abundant promise and I'll be following its progress with more than a little interest.

OpalVision can be had in America for US$999, mail order – though an average retail price could be closer to $1300. Add freight and insurance (say $100 for FedEx), import duty, VAT and the cost of a money order and it will probably come in at a price of around £720 inclusive, assuming a 1.9 £/$ exchange rate.

Just a thought, if you don't need support.

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CHECKOUT OPALVISION

Documentation ●●●●●
Excellent for installation and instruction.

Features ●●●●○
With a great paint program, a good slide show, backdrops and utilities there's not much more that you could reasonably ask for.

Quality ●●●●●
Top quality all round.

Price Value ●●●●○
Pretty good, considering what you get for the money.

Overall rating ●●●●○

A potentially amazing product which will show its worth when the video modules become available. Until then the motherboard and *OpalPaint* are a great starter – and of course provides an all-in 24-bit paint and display package.

ENHANCED *Imagination*

Gary Whiteley reviews two new products which are guaranteed to improve your use of Imagine

Let's face facts, Impulses's *Imagine 3D* software can be very frustrating to use, as even seasoned users will attest, and the most hardened fanatic can be brought to his knees when something goes wonky with their favourite renderer. The trouble is, it's not usually the software which is at fault, more often the user simply tackling a problem from the wrong angle, or without the proper knowledge.

Aware that many folks have problems with *Imagine*, American maths graduate Steven Worley, and his company Apex Software Publishing, have been working hard over the last year on two excellent products to help Imagineers get the best from their systems.

Their first offering is a book, *Understanding Imagine 2.0*, which takes an in-depth look at many of the more incomprehensible features of this powerful ray-tracing package and affords illumination for the most seasoned user, as well as the novice. The second is a wild collection of algorithmic textures, called *Essence*, for use with *Imagine 1.1* or *2.0*, as well as with the earlier TurboSilver software.

Understanding Imagine 2.0 is an A4 sized, spiral-bound handbook with over 200 pages on the length and breadth of *Imagine 2*, explaining the finer points of everything from brush mapping to 3D modelling. Think of it as a supplement to the original software manual. It's far more comprehensive than David Duberman's *Imagine Companion* book, and a vast improvement over the manual, even venturing into previous no-go zones such as the dreaded Forms Editor and how the mathematics of spherical brush mapping work. It is well indexed, and sidebars often provide minor pearls of wisdom. There are separate chapters covering all the various editors, plus tricks and tips, texture and effects descriptions and even a table of useful surface attributes.

LEARNING CURVE

I took it steadily, reading the book and thankful to be able to have a legitimate excuse to play with *Imagine*. I was amazed at just how much I learnt and, though I would regard myself as being pretty *au fait* with *Imagine*, this book corrected me on some of the things that I had concluded just didn't work properly, such as how to do a proper spherical brush wrap! Or, why a ground object has to be mapped with the Y axis of the brush pointing downwards!

It also inspired me to new heights, stimulating my curiosity and pointing me off in new directions of experimentation and back to old projects that I had left unfinished for lack of knowledge. Designing brushmaps for objects became a pushover, and my use of global reflection mapping has improved no end.

For all its good points, Understanding *Imagine 2.0* does have a few faults. Americanisms aside, some of the grammar *is* a little strange and requires rereading several times to get the message straight. But perhaps this isn't such a bad thing, as this is a book which definitely repays multiple readings.

I have always enjoyed using *Imagine,* despite its shortcomings, but *Understanding Imagine 2.0* has really shifted me up a gear. I thoroughly recommend it.

ESSENCE

I first heard about *Essence* in late June when I read several exciting rumours on the e-mail 'nets about a new set of algorithmic textures for use with *Imagine*. As soon as I heard it was released I took the plunge and ordered a copy direct from the States. In the meanwhile, people were reporting how great the fractal noise, marble and bump textures were, and what amazing things were being done using *Essence*. I simply couldn't wait.

A couple of weeks later I had the single disk and sensibly-sized manual in my hands and, after quickly backing up the disk and flicking through the manual while installing the textures onto my hard drive, I began my journey into the fourth dimension. I say fourth because the *Essence* textures can also be manipulated in time, as well as space, so they can be made to fade across frames of an animation, or even change smoothly from one texture to another.

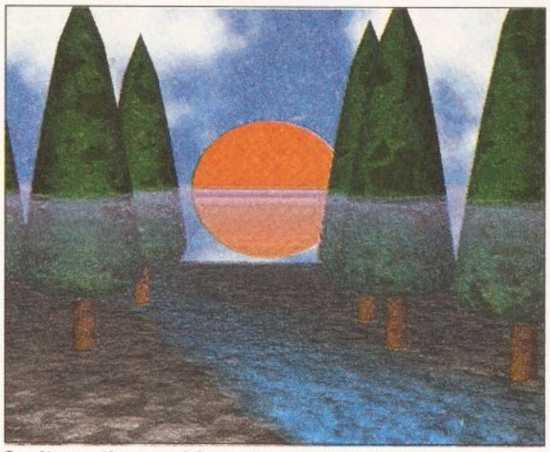
But where to start? So many options... fractal noise, bumps, geometric patterns, treebark, marble, and many more – in fact 64 textures in total. And so many parameters to fiddle with, there are a lot more possibilities than even 64 would suggest.

I began with some simple things, such as putting an atmosphere around an earth globe, and playing with texture parameters. But before long I had produced a 60 frame animation of the Earth rotating with swirling clouds moving over its surface. I was impressed!

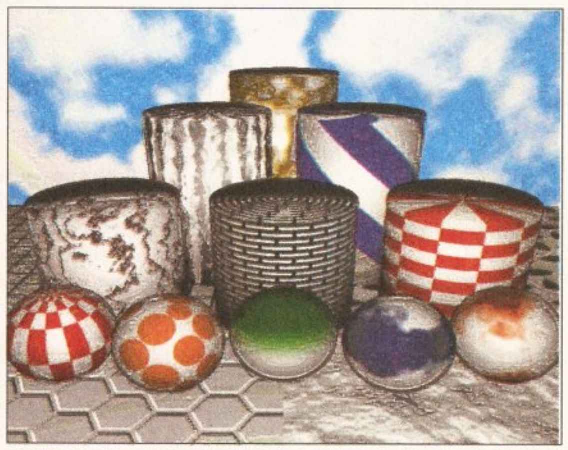
Although the manual is more of a guide book than pure instructions, there are many handy hints to help manipulate the textures. Some of them are designed to work in two dimensions only, others give the full three dimensional treatment. There are some disconcerting omissions too, and I found myself grappling without success with some of the textures when a simple axes-placement diagram would have helped tremendously!

By using multi-layered textures, as well as brushmaps and attributes, a great range of surfaces can be conjured up. For instance, as Imagine users will know, four textures can be combined together on one object and overlaid in layers. This can lead to some interesting effects – such as cloudy, dirty marble, or spotty, gridmapped floors.

The bad news is that *Essence* can only be used on Amigas which have a floating point unit (FPU), which means having a 68020 or '030 accelerator. No doubt many *Imagine* (or Turbo Silver) fans will be disappointed, but remember that even on a fast '030 machine these textures can take a while to render, so imagine how long they would take on a standard Amiga!



Can't see the wood from the trees, or just plane stumped? Spruce up with this poplar new package!



Get in shape with a range of techniques and textures that promise to get the creative ball rolling

At going to press there there was not yet a UK distributor, but this may well have changed by the time you read this. Ask your dealer!

Gary Whiteley can be e-mailed as drgaz@cix.compulink.co.uk.

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by Apex Software Publishing Ltd

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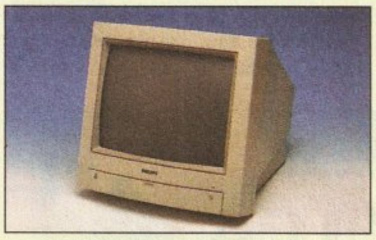
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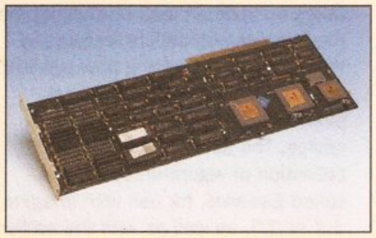
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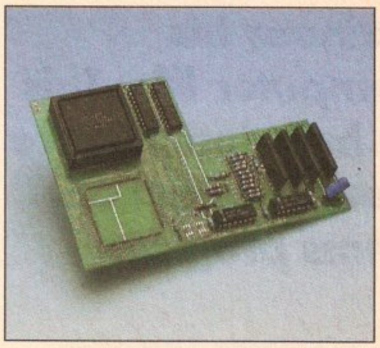
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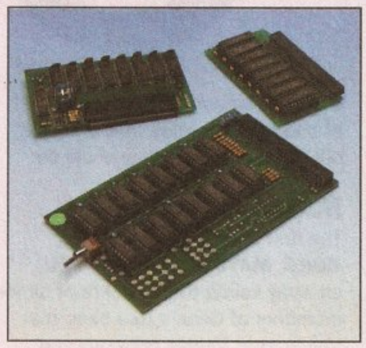
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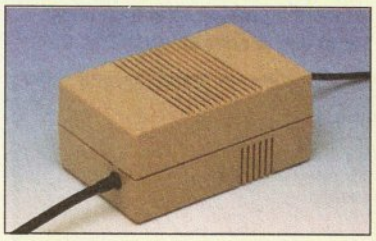
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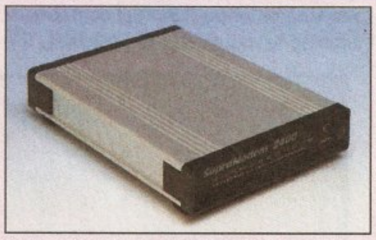
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Pure Genius...

Philip Gladwin continues his journey through computer life. This month he explains how intelligence is born. PLUS: the second part of the genetic algorithms program

Last month I described how to create a virtual creature, called Gene, whose sole aim in life was to find food. This time I'm going to show you how Gene actually moves around in the wood and develops an intelligent approach to his task.

STRUCTURED CODE

Let's start properly, with a little top down analysis. Figure 1 shows you how the code is structured. You've already got the code to initialise Gene and his wood, along with some other mechanical stuff. Now it's time to look at the main body of the program. ***Procedure CYCLE*** breaks down into three operations – Gene finds some food, ***(PROBLEM)***; his classifier rule_base, or memory, undergoes a transformation along genetic principles, ***(GENETIC)***; and the current state of his ability is graphed in ***(GRAPH_RESULT)***.

PROCEDURE PROBLEM

This month we'll be looking at ***PROBLEM***. Gene starts on each search for food afresh. ***PLACE_GENE*** makes sure that he begins in a randomly selected space in the wood, and then ***WALK*** makes him wander around the forest until he moves into a space containing food and he gets a reward. Let's look at each procedure called in ***WALK***.

The code for ***DRW_WOOD*** came last time – this has nothing to do with Gene's education, it simply provides a window on what he is doing for anyone who is interested. ***REFRESH_VECTOR*** is similarly straightforward, using ***FIND_CONTENTS[]*** to look in each of the squares of the grid around Gene, (remembering that Gene doesn't notice the edges of the grid). It uses this information to build the Global string ***GENE_VISION$***.

Now, one of the things about life in the real world is that it is prone to mutation caused by all sorts of factors, such as the occasional stray cosmic ray. To imitate this scarce random effect ***WALK*** can call ***NEW_CLASSIFIER*** with a probability of 2%. This deletes – at random – an existing classifier from the classifier base, creates a new one at random, and puts it into the vacant slot. This does mean that good rules can be lost as well as bad rules, but, by making sure that the rulebase is never completely finalised, it ensures that it never comes to rest on a set of bad habits – rules that are good, but not as good as they could be.

MAKING MATCHES

The first section of ***BUILD_MATCH_SET*** creates ***M()*** – an array listing the numbers of all the members of Gene's rule base that match what he can currently see. There is a problem with this – it's quite possible for Gene to come across new situations that he has no recognition of (ie ***RULE$()*** contains nothing to match ***GENE_VISION$***). If this happens (***RULE_MATCH = 0***) then ***BUILD_MATCH_SET*** calls ***NEW_CLASSIFIER***. Notice that ***NEW_CLASSIFIER*** bases the rule it creates on ***GENE_VISION$***, but randomly substitutes "?". It gives it a new, random action and a strength of 100. This guarantees that the new rule will at least match the current situation, even if it's not a very good rule and, say, tells Gene to move directly away from food.

Having created a list of all the classifiers possessed by Gene that match what he can currently see, (called the match set from now on), ***WALK*** calls ***SELECT_CLASSIFIER*** to pick the rule that Gene will actually use this time. This is one of the more complicated procedures in the program, and it's wise to have an overview of what it's supposed to do before you spend a lot of time looking at the code.

SELECT_CLASSIFIER picks a rule from the match set using a probability distribution over the strengths of the classifiers in the match set. (More precisely, the probability of selection of a particular rule in the match set is equal to its strength divided by the sum of strengths of the rules in the match set.) I don't particularly want to go into how the code does all this because it isn't especially interesting. All that you really need to know here is that the rules in the match set with the larger strengths are more likely to be picked than the rules with the lower strengths.

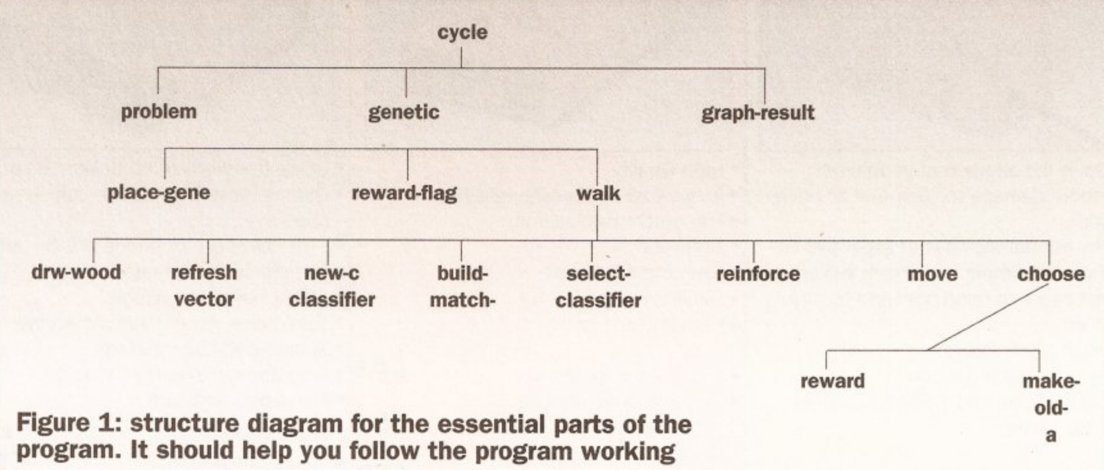


Figure 1: structure diagram for the essential parts of the program. It should help you follow the program working

POSITIVE REINFORCEMENT

The last thing I want to look at this time is ***Procedure REINFORCE*** – part of the adaptation of the classifier rule base that leads to Gene developing "intelligence".

As we can see in ***SELECT_CLASSIFIER***, the strength of a rule is a major contribution to how often it is picked, and therefore how strong an influence it has on Gene's actions. If Gene is to learn from the past we need a method of increasing the strength of the classifiers that lead to Gene moving towards food, and decreasing the strength of the classifiers that tend to take Gene away from food. This works as follows. First, create the action set. This is the array ***A()***, containing a list of the rules that are in the match set and which have an action the same as the chosen action. Take from each of the classifiers in this action set a proportion of their strength, total it, and divide it up among all the classifiers which were members of the Action set on the previous step. Gene then moves, and if he finds food this is noticed, and later, in ***Procedure REWARD***, reward is distributed among the strengths of the current action set. If he doesn't find food then all the classifiers in the current action set are shifted into the previous action set. This creates a chain, allowing rewards to flow back along a path of rules, reinforcing every contributing classifier.

COMING NEXT MONTH

Procedures ***MOVE*** and ***CHOOSE*** are fairly self-evident, and I haven't really the space to go into them anyway. Next month we'll be looking at the heart of the program, ***Procedure GENETIC***, and I'll show you how to produce a graph that lets you know if Gene is really making progress in his learning. AS

PUZZLED BY THOSE SYMBOLS?

Because of the width of the columns, we occasionally have to break a listing across two or more lines. Where this has occurred and you enter two or more lines without a [Return] between them, we've used the following symbol ↵

GENETIC ALGORITHM PROGRAM – PART 2 • GENETIC ALGORITHM PROGRAM – PART 2

```
' GENETIC ALGORITHM PROGRAM
' PART 2 - Enter after ↵
last month's listing
Procedure BUILD_MATCH_SET
 ' Finds the match set. ↵
Looks for all the rules ↵
whose classifier
 ' section is identical to↵
what Gene can see.
 ' Steps through the ↵
classifier base one by one,↵
and for each it checks each
 ' classifier character ↵
against the equivalent
 ' character in ↵
GENE_VISION$. If the ↵
character is the same, or ↵
if the rule has a "?", then↵
the counter is incremented.
 ' If COUNTER = 16 after ↵
checking through all the ↵
characters then the rule ↵
matches what Gene can see, ↵
and is tagged as
 ' being part of the Match↵
set in M().
 For I=1 To 40 : Rem Flag ↵
the members of M
   If STRENGTH#(I)<20.0
    NEW_CLASSIFIER[I]
   End If
   TEMP=0
   POI$=RULE$(I,1)
   For J=1 To 16
    If(Mid$(POI$,J,1)="?")↵
or(Mid$(GENE_VISION$,J,1)=M↵
d$(POI$,J,1)) Then Inc TEMP
   Next J
   If TEMP=16
    M(I)=1
    RULE_MATCH=1
   End If
 Next I
 If RULE_MATCH=0
   PLACE=Rnd(39)+1
   NEW_CLASSIFIER[PLACE]
   M(PLACE)=1
 End If
End Proc
Procedure CHOOSE
 If REWARD_FLAG=1
   REWARD
 Else
   MAKE_OLD_A
 End If
 For I=1 To 40
   A(I)=0
   M(I)=0
 Next I
End Proc
Procedure MOVE[CLASSIFIER]
 ACTION$=RULE$(CLASSIFIER,2)
 If YLOC-1=0
   YMINUS=16
 Else
   YMINUS=YLOC-1
 End If
 If YLOC+1=17
   YPLUS=1
 Else
   YPLUS=YLOC+1
 End If
 If XLOC-1=0
   XMINUS=16
 Else
   XMINUS=XLOC-1
 End If
 If XLOC+1=17
   XPLUS=1
 Else
   XPLUS=XLOC+1
 End If
 If ACTION$="0"
   LEVEL$=WOOD$(YMINUS) : ↵
CONTENT$=Mid$(LEVEL$,XLOC,1)
   If CONTENT$<>"T"
    YLOC=YMINUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="1"
   LEVEL$=WOOD$(YMINUS) : C↵
ONTENT$=Mid$(LEVEL$,XPLUS,1)
   If CONTENT$<>"T"
    YLOC=YMINUS : XLOC=↵
XPLUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="2"
   LEVEL$=WOOD$(YLOC) : CON↵
TENT$=Mid$(LEVEL$,XPLUS,1)
   If CONTENT$<>"T"
    XLOC=XPLUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="3"
   LEVEL$=WOOD$(YPLUS) : CO↵
NTENT$=Mid$(LEVEL$,XPLUS,1)
   If CONTENT$<>"T"
    YLOC=YPLUS : XLOC=XPLUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="4"
   LEVEL$=WOOD$(YPLUS) : ↵
CONTENT$=Mid$(LEVEL$,XLOC,1)
   If CONTENT$<>"T"
    YLOC=YPLUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="5"
   LEVEL$=WOOD$(YPLUS) : CO↵
NTENT$=Mid$(LEVEL$,XMINUS,1)
   If CONTENT$<>"T"
    YLOC=YPLUS : ↵
XLOC=XMINUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="6"
   LEVEL$=WOOD$(YLOC) : CO↵
NTENT$=Mid$(LEVEL$,XMINUS,1)
   If CONTENT$<>"T"
    XLOC=XMINUS
   End If
   Goto LEAVEPROC
 End If
 If ACTION$="7"
   LEVEL$=WOOD$(YMINUS) : ↵
CONTENT$=Mid$(LEVEL$,↵
XMINUS,1)
   If CONTENT$<>"T"
    YLOC=YMINUS : ↵
XLOC=XMINUS
   End If
   Goto LEAVEPROC
 End If
 LEAVEPROC:
 If CONTENT$="F"
   REWARD_FLAG=1
 End If
 If CONTENT$="T"
 End If
End Proc
Procedure NEW_↵
CLASSIFIER[PLACE]
   TEMP$=Right$(GENE_↵
VISION$,16)
   For I=1 To 16
    If Rnd(3)=0 Then ↵
Mid$(TEMP$,I,1)="?"
   Next I
   RULE$(PLACE,1)=TEMP$
   RULE$(PLACE,2)=↵
Str$(Rnd(7))-" "
   STRENGTH#(PLACE)=100.0
End Proc
Procedure PLACE_GENE
   Repeat
    XLOC=Rnd(15)+1
    YLOC=Rnd(15)+1
    If Mid$(WOOD$(YLOC),↵
XLOC,1)="." Then PLACED=1
   Until PLACED=1
End Proc
Procedure PROBLEM
   PLACE_GENE
   REWARD_FLAG=0
   WALKED=0
   Repeat
    WALK
   Until REWARD_FLAG=1
End Proc
Procedure REFRESH_VECTOR
   GENE_VISION$=""
   For I=0 To 7
    FIND_CONTENTS[I]
    CONTENTS$=Param$
    If CONTENTS$="." Then ↵
TEMP$="00"
    If CONTENTS$="T" Then ↵
TEMP$="01"
    If CONTENTS$="F" Then ↵
TEMP$="11"
   GENE_VISION$=↵
GENE_VISION$+TEMP$
   Next I
End Proc
Procedure REINFORCE↵
[CLASSIFIER]
   ' Complete Action Set ↵
details - remove
   ' 20% tax on Action set
   ' and distribute it to ↵
the old action set
   CHOSEN_ACTION$=Mid$↵
(RULE$(CLASSIFIER,2),1,1)
   GROSS_TITHE#=0.0 : COUNT=0
   For I=1 To 40
    If M(I)=1
     If CHOSEN_ACTION$=↵
Mid$(RULE$(I,2),1,1)
       A(I)=1
       GROSS_TITHE#=GROSS_↵
TITHE#+(STRENGTH#(I)*0.2)
       STRENGTH#(I)=↵
STRENGTH#(I)*0.8
       Inc COUNT
     End If
    End If
   Next I
   If COUNT=0
    Print #1,"CLASSIFIER: ↵
";CLASSIFIER
    Print #1,"CHOSEN_↵
ACTION:  ";CHOSEN_ACTION$
    For I=1 To 40
     Print #1,A(I);"  M: ↵
";M(I);"  rule action: ↵
";RULE$(I,2)
    Next I
    Wait Key
   End If
   TITHE#=GROSS_TITHE#/COUNT
   For I=1 To 40
    If OLD_A(I)=1
      STRENGTH#(I)=↵
TITHE#+STRENGTH#(I)
    End If
    If M(I)=1
      STRENGTH#(I)=STRENGTH#↵
(I)*0.95 : Rem 5% tax to ↵
break loops
    End If
   Next I
End Proc
Procedure REWARD
   For I=1 To 40
    If A(I)=1
     Inc COUNTER
    End If
   Next I
   REWARD#=200.0/COUNTER
   For I=1 To 40
    If A(I)=1
      STRENGTH#(I)=↵
STRENGTH#(I)+REWARD#
    End If
   Next I
End Proc
Procedure SELECT_CLASSIFIER
   Shared PERCENT()
   ' Work out combined ↵
strength of M:
   M_STRENGTH=0
   For I=1 To 40
    If M(I)=1
      M_STRENGTH=↵
M_STRENGTH+STRENGTH#(I)
    End If
   Next I
   PTR=1
   For I=1 To 110
    PERCENT(I)=0
   Next I
   For I=1 To 40
    If M(I)=1
      STR=Int((STRE↵
NGTH#(I)*100.0)/M_STRENGTH)
      If STR>0
       For J=1 To STR
        PERCENT(PTR)=I
        Inc PTR
       Next J
      End If
    End If
   Next I
   Repeat
    RTN=PERCENT(Rnd(99)+1)
   Until RTN>0
End Proc[RTN]
Procedure WALK
   DRW_WOOD
   REFRESH_VECTOR
   If Rnd(99)<2
    PLACE=Rnd(39)+1
    NEW_CLASSIFIER[PLACE]
   End If
   BUILD_MATCH_SET
   SELECT_CLASSIFIER
   CLASSIFIER=Param
   REINFORCE[CLASSIFIER]
   MOVE[CLASSIFIER]
   CHOOSE
   For I=1 To 40
    M(I)=0 : A(I)=0
   Next I
   Inc WALKED
End Proc
```

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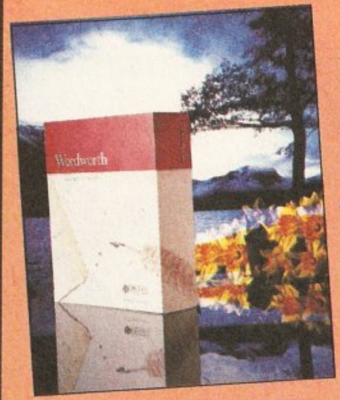
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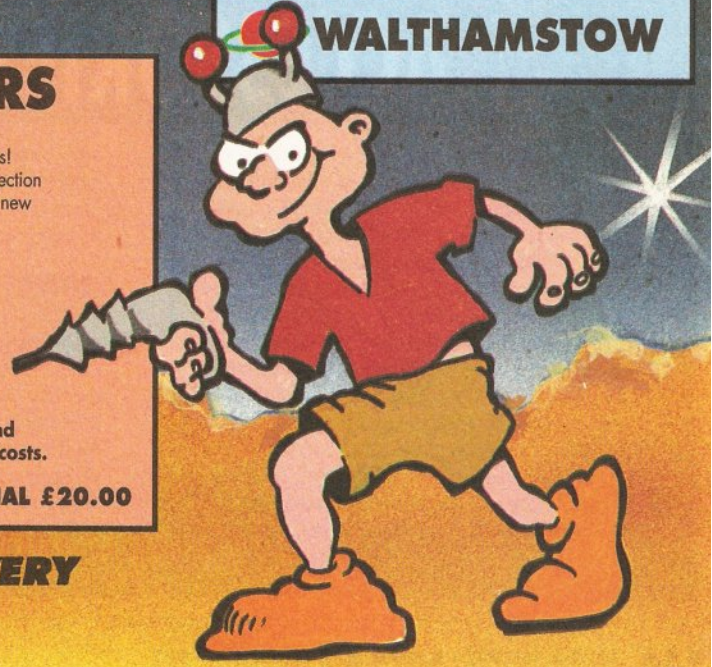
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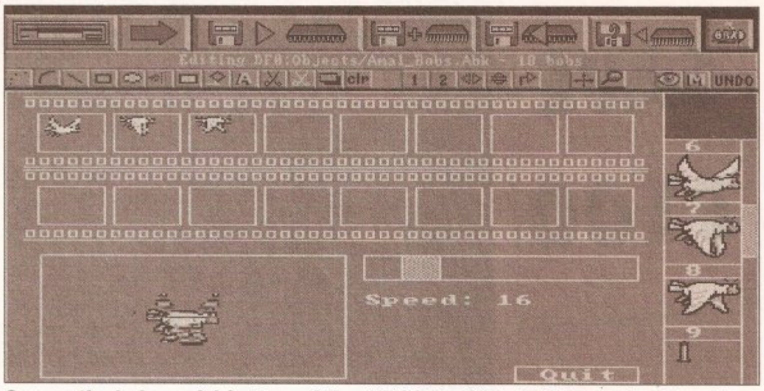
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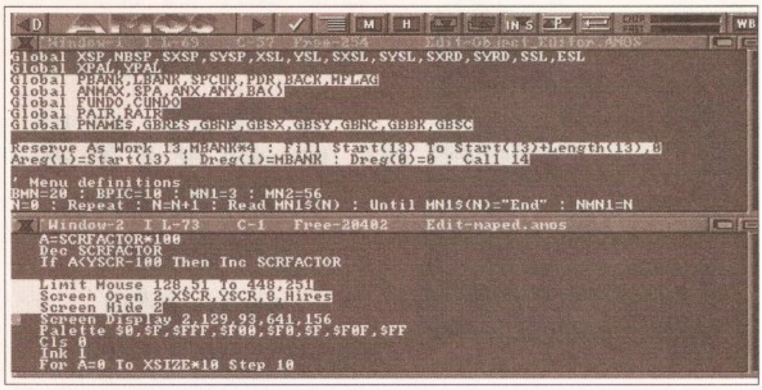
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One particularly useful feature of the *AMOS Pro* Object Editor is its animation facility, allowing you to test an animated object before committing it to code



Gone is the *AMOS* editor of old and in its place is a very swish affair that not only looks good, but performs with panache

BEGINNERS — **BEGINNERS START HERE** — **BEGINNERS**

What's so special about AMOS anyway?

As any programmer will tell you, the Amiga can be programmed in two ways – through the operating system (this is called 'High Level programming') and by directly accessing the Amiga's hardware (low level programming).

Although high level programming ensures a greater level of compatibility with future Amigas and operating system revisions, the OS routines are just too slow for programs that require high speed scrolling, animation and lots of sprites and bobs.

Because *AMOS* was in the first place written as a language for games and demo programming, *AMOS* bypasses the Amiga's slow operating system routines and 'hits' the hardware directly. As a result, *AMOS* allows you to achieve the sort of results that were up until now only possible with the use of a low-level programming language, such as Assembler, for example. Unlike assembler though, *AMOS* protects you from the technicalities of setting up the custom chips and accessing the Amiga's central processor, the 68000.

By using a very powerful implementation of BASIC, the Amiga's hardware can be programmed, using simple easy-to-understand, BASIC commands.

In many cases, programs that would have previously needed hundreds of lines of assembler code can be knocked up in *AMOS*, using considerably less code.

AMOS

Software developer Charlotte Hemmings discovers the delights of AMOS Professional, the latest work from Europress' hardware-hittin' programming language

It's unusual for a programming language to make much of an impact unless it offers something radically different from the competition, but this is exactly what Europress' *AMOS* has managed to achieve. During the two and-a-half years that it has been available, *AMOS* has sold in the sort of quantities that you'd usually only associate with a top-notch game. What's more, it's attracted attention and support from all quarters of the Amiga community, resulting in the release of third party extensions, the establishment of dedicated user groups and even the regular publication of *AMOS* sections within magazines such as *Amiga Shopper*.

Not wanting to rest on its laurels, Europress has done its bit too with the release of the *AMOS Compiler*, *AMOS 3D* and – more recently – *Easy AMOS*, a cut-down version of the original *AMOS* interpreter designed with first-time programmers in mind. With *AMOS* you can now write just

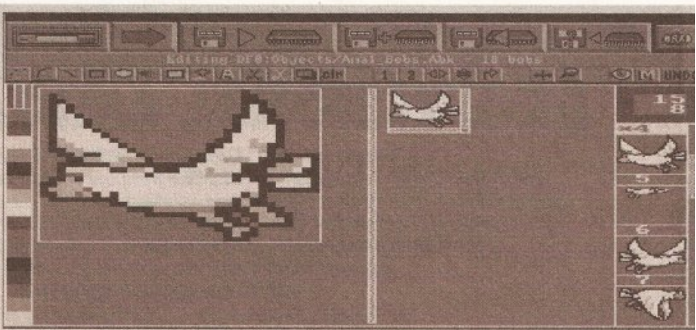
...ACCESSORIES...

As any professional programmer will tell you, there's far more to software development than simply writing code. If you're a games programmer, you'll need a number of extra tools which will allow you to incorporate graphics and sound effects into your programs. As you'd expect, *AMOS Pro* comes complete with a healthy selection of support utilities which make this task somewhat easier. The original *AMOS* came with a fairly healthy selection of these 'accessories', but to be perfectly honest, they were pretty unimpressive.

Thankfully Europress have realised this too. In an attempt to rectify this, Europress have recoded virtually all the AMOS accessories so that they not only share a common look and feel, but are also both easy to use and very flexible. Here's a rundown of the more commonly used accessories on offer.

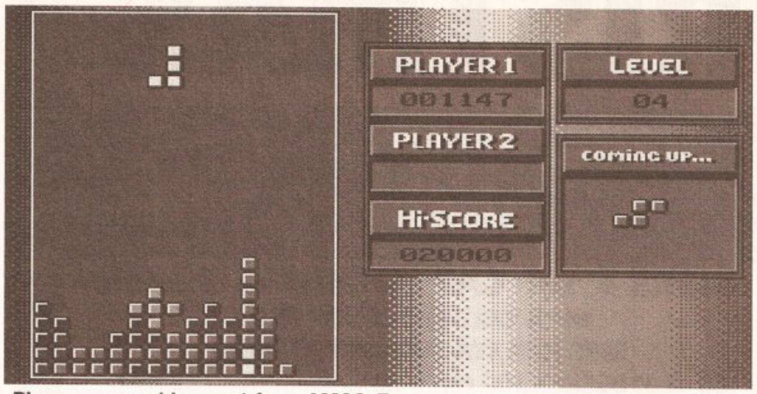
OBJECT EDITOR

With all due respect to Aaron Fothergill (the author of the original *AMOS* Object Editor), it's nice to see that Europress have dumped the original object editor into the Workbench Trashcan and have replaced it with a far more capable beast altogether. Looking not too dissimilar to the Easy *AMOS* Object Editor, the *AMOS Pro* Object Editor offers all the sprite and blitter object editing functions you're ever likely to need in one package. Complete with the now obligatory bas-relief gadgets, the *AMOS Pro* object editor is a real joy to behold.

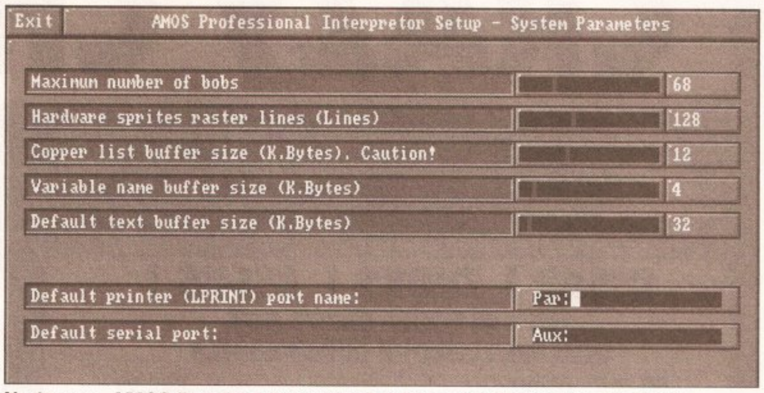


Bird brainy: the AMOS Pro object editor is a vast improvement over the original version

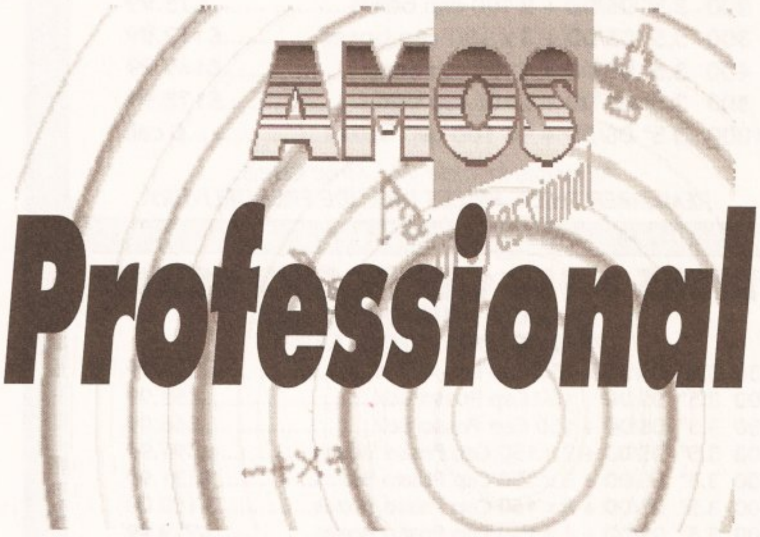
One very nice feature of this new editor is its ability to preview animated objects. Simply by clicking on each frame in sequence, *AMOS Pro*



Play on: as you'd expect from *AMOS*, Europress kindly supply a nice selection of demo programs and games. This one's a very playable *Tetris* clone



Up to you: *AMOS Pro* gives you considerable control over your working environment via on-line configuration programs



about any program with the sort of ease that you'd associate with BASIC, but with the speed and quality of results that you'd normally only expect to get after hours slaving over a hot assembler. Ultra-smooth scrolling, high-speed blitter objects, sprites, sampled sound effects and interrupt-driven music are only a small selection of the sort of things that are possible with *AMOS*.

It has to be said though that despite its obvious power, *AMOS* was far from perfect. As the author of *AMOS*, Francois Lionet, soon discovered, spoiling programmers with such advanced yet easy-to-access facilities can backfire. Once the initial fascination had worn off, *AMOS* programmers wanted more and more. Now, two and-a-half years on from that fateful day, *AMOS* has been reborn in the shape of *AMOS* Professional, the latest and undoubtedly the greatest version of *AMOS* ever to see the light of day. Is *AMOS* now perfect? Read on to find out.

BOX CLEVER

Europress are obviously very keen to let potential buyers know that they aren't just buying another version of *AMOS* with a couple of extra bits and pieces tacked on for good measure. Virtually every aspect of *AMOS* has been either enhanced or even totally rewritten to make *AMOS Professional* live up to its name. For starters, the rather tacky *AMOS* packaging has been given the boot and in its place is some very attractive looking artwork that not only looks better, but also helps to give *AMOS* a more professional feel. I must admit though that I'm still not totally happy with the *AMOS* packaging – most professional programming languages come in sturdy box folders that can be thrown about and even stood on without causing much damage. As it is, the *AMOS* box is still a little too flimsy for comfort. OK, perhaps I'm being too picky, but then this sort of thing must be considered if the *AMOS* packaging and manual is to survive in the average working environment.

One aspect of the packaging that does get the proverbial thumbs up though is the new *AMOS* manual. I must admit that I was never a great fan of the original's manual, so it's nice to see that Europress have dumped this too in favour of a much more comprehensive and certainly more readable manual, written by Mel Croucher, the author of the brilliant *Easy AMOS* manual. As you'd expect from Mel's talented typing fingers, it's packed with lucid explanations and is very well thought out indeed. Not only does it take you through those shakey first few sessions with your new programming language, but it also acts as a very good reference manual for experienced *AMOS* coders such as myself. Definitely top marks here!

The old disk count has risen considerably too. The original release of *AMOS* arrived on just three disks (the main program disk, a demonstration disk and the freebie Sprites-600 disks), but *AMOS Pro* now occupies double that figure. There's the main *AMOS Pro* program disk, a separate Accessories disk, a tutorials disk, an examples disk and two so-called 'Productivity' disks (more example programs basically). For those of you who entered our 101 procedures competition, you'll be pleased to know that all the winning entries are in there too!

continued on page 118

displays the object as it will appear when animated under AMAL. The object editor can also grab objects directly from an IFF file – good news if you prefer to design your sprites and bobs in a dedicated art package such as *DPaint*.

SAMPLE BANK MAKER

Another utility borrowed from *Easy AMOS* is the *Sample Bank Maker*, a useful little program which is used to pull together banks of sampled sounds ready for use within your own programs. Thanks to that very handy 'Left Amiga + A' hotkey mentioned earlier, you can grab sounds using your favourite sampler and pull them straight into an *AMOS* bank. If the sample still needs fine tuning, you can then swap back to the sampler editing software and edit it to meet your needs. Isn't multitasking wonderful?

RESOURCE EDITOR

Designing attractive looking front ends for programs has never been so easy. Designed for use with *AMOS Pro's* new Interface language, the *AMOS Pro* Resource Editor is used to build up a resource file containing all the gadgets that your program requires. It won't allow you to draw them directly though – you'll need a paint package such as *DPaint* for this. All you have to do to create a new gadget is to load in the IFF file containing the gadget image and then drag out a rectangle around the gadget. Couldn't be simpler!



Banking on success: pack those samples into a bank with ease using the new AMOS Pro Sample Bank Maker

DISK MANAGER

Another very nice if slightly redundant accessory (especially if you already own a program such as Directory Opus) is the *AMOS Pro* Disk Manager, a SID-like directory utility which allows you to carry out all those disk-related chores such as copying, deleting and renaming files, formatting disks, etc, without having to get your hands dirty with AmigaDOS.

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continued from page 115

CLOSE TO THE EDIT

Playing around with the packaging and all those disks is all well and good, but let's get stuck in to *AMOS Pro* itself. Booting up *AMOS*, it's time for pleasant surprise number two – the *AMOS* Source code editor has undergone major refurbishment and a considerable amount of enhancement. Gone is the rather blank and really quite unprofessional editor of old and in its place is a very swish affair that performs just as well as it looks. Oh joy! No more must we suffer the frustration of having to work with the original's garish colours and blocky gadgets and requesters.

Thanks to the implementation of *AMOS Pro's* new 'Interface' language (more on this later), the *AMOS Pro* Editor has been dragged out of the eighties and now looks and performs how a real Amiga application should. Apart from the obvious colour palette change (I know, I know, you can't see those colours in *Amiga Shopper)*, the *AMOS Pro* Editor shares a more Workbench 2.0-feel complete with 'real' Intuition pull-down menus and raised bas-relief gadgets.

Those pull-down menus really are a welcome addition – unlike the previous *AMOS editor*, you've now got far more editing power at your fingertips. There are some genuinely useful new options in there too, including 'Check 1.3' which – as the name suggests – allows you to check that your *AMOS Pro* source code is compatible with the old version of *AMOS*. You can also access the *AMOS* accessories directly from the pull-down menus too, again very useful.

The *AMOS* gadgets have been extended considerably too. As well as the usual 'Test' and 'Run' functions, there are also a couple of new facilities which allow you to collapse and expand procedures, indent nested code correctly (making code more readable), and so on. Another welcome addition is *AMOS Pro's* on-line help facility which gives you instant access to information on *AMOS* and its commands without having to flick through the manual. Users of Europress' *Easy AMOS* will probably recognise this facility straight away. On-line help isn't the only pass-me-down from *Easy AMOS*. Quite a few of the *AMOS* accessories bear more than a striking resemblance to their *Easy AMOS* counterparts.

Many of these new options and gadgets can be accessed through 'hot key' combinations. In particular, one new hotkey facility that I've personally found particularly useful is the <Left Amiga> <A> option which swaps you backwards and forwards between *AMOS Pro* and the Workbench. If you're writing an *AMOS* application that uses files produced by other programs *(DPaint* or *AudioMaster IV*, for instance,) this can be a real time-saver as you can have both Intuition applications and *AMOS* running concurrently – what's more, you can even swap back to Workbench whilst an *AMOS* program is running! This facility alone makes software development far easier.

Finally, Europress have added the facility to edit more than one source file simultaneously without having to use the original's rather useless 'Edit Other' function. The main editing area can be subdivided and separate source files loaded into each division. The number of source files that can be loaded isn't just limited to two either – you can load as many source files as your heart desires and then cut, copy and paste sections of code between them.

"Europress have done us proud with no less than 200 new commands"

SOMETHING BORROWED... SOMETHING NEW

That's not to say that all the new facilities offered by *AMOS Pro* are simply brought across from an earlier product. The *AMOS Pro* command set has been extended extensively to provide direct support for many of the facilities that existing users have been crying out for. It's nice to see a software company take note of its users and Europress certainly have done us proud with no fewer than 200 new commands and functions that extend an already impressive command set. Most of these are dedicated to the new interface language, but there's still a number of major enhancements that extend *AMOS'* abilities extensively.

One aspect of *AMOS* that proved to be a major pain was its printer support which was, to say the least, sadly lacking. Not wanting to get caught out again, Europress have addressed this problem with the implementation of some considerably powerful printer control

AREXX MADE EASY

All you multitasking buffs will also be pleased to hear that *AMOS Pro* now directly supports ARexx, William Hawes' task communications language which is bundled with Workbench 2.0. Obviously ARexx is of little use to your average games or demo coder, but it does open up some quite exciting new avenues for *AMOS* program development – multimedia applications development is just one that springs to mind. With ARexx support at your side, there's no reason whatsoever that ARexx couldn't be used to take advantage of CD quality sound tracks, full-motion video or indeed just about anything that can be accessed and controlled via ARexx. As you can know doubt appreciate, the possibilities are endless.

The commands that *AMOS Pro* provides for ARexx support give you the ability to receive and send messages to a named ARexx 'port', wait for a message from a named port, check the availability of a named port and much more besides. ARexx compatibility is a really smart move from Europress – *AMOS Pro* is now the one and only language available that provides high level support for ARexx, giving it a major and significant advantage over its competitors.

JARGON BUSTING • JARGON BUSTING

BOBS – Short for Blitter Objects. Bobs are graphic objects which can be moved around the screen at high speed using the Amiga's powerful Blitter.

SPRITES – Similar to Bobs, Sprites are high speed graphic objects which can be moved around the screen at much higher speeds than Blitter objects. They are therefore commonly used in high speed arcade games for such things as missiles and other fast moving objects.

INTERRUPT – Interrupts are a very powerful facility offered by the Amiga's central processor which allows a program to do several things at once, independant of each other. A good example of this is *AMOS'* ability to play soundtracks – because the soundtrack is played under interrupt, it will continue to play while *AMOS* executes the rest of your program.

AREXX – ARexx is a powerful programming language built into Workbench 2.0 that allows one program to control the operations of another. You can find out more by following the ARexx column which is published regularly in Amiga Shopper.

DEBUGGER – A debugger is a program which lets you find 'bugs' (logic errors) in a program by single stepping through the program to see its effect on the machine. A dedicated debugger can make the process of removing 'bugs' in a program faster and considerably less frustrating.

DEBUGGING MADE EASY



Squash those bugs before they can do any harm with the Monitor, a powerful debugging tool built into the *AMOS Pro* editor

Lurking in the new improved *AMOS Pro* editor is a little gadget marked 'M' that holds the secret to debugging *AMOS Pro* programs. If you've ever sweated over a bug that just won't show itself, then this is the program for you. Based around the Tutor facility first introduced into *Easy AMOS*, the *AMOS Pro* monitor is a very powerful source-level debugger that allows you to monitor (hence the name) the execution of your code and its effect on your Amiga.

Once selected, you're transported to a very neat looking screen that is split into two sections – at the bottom of this screen is your source code and at the top you'll find an array of different gadgets and a window which displays a scaled representation of the graphical output from your program.

Using these gadgets, you can single step through your code and see what's going on in the scaled

commands. For starters, there's now a pull-down menu option which allows you to print your program listings without having to mark the entire source file as a block first. How we ever survived before without this facility, I'll never know!

It's nice to see too that these new printer control commands don't just access the parallel or serial ports – instead, as soon as you issue the new 'PRINTER OPEN' command, *AMOS Pro* reads in the current Preference settings, allowing your program to legally access any printer, regardless of its type, complete with a set of standardised and user-definable escape codes (access your printer's fonts from within *AMOS!)*. This isn't too important at the moment, but rumour has it that Commodore are developing a Postscript printer driver for a future release of the Amiga's operating system, allowing any program to print to a Postscript device *regardless* of whether the application supports Postscript or not. Try to write pure ASCII to a Postscript printer and you'll get no end of problems!

ANIMATED IFFS

Graphics-wise, probably the most major addition is direct support for IFF ANIM format animations. Why anyone would want to play IFF animations within their programs is beyond me, but it's there if you need it. *AMOS Pro* can handle animations in just about any standard Amiga view mode (even HAM!), although by the very nature of complex animation, these should be restricted to title screens and 'in game' incidental breaks, etc. It has to be said, however, that *AMOS Pro's* ANIM implementation is pretty impressive, though according to Europress, *AMOS Pro* can actually play back animations faster than than *DPaint!*

Surprisingly, *AMOS Pro* doesn't provide direct support for the Enhanced Chip Set, let alone the new AGA (Advanced Graphics Architecture) chip set in the A4000. OK, so the lack of AGA support isn't really that surprising, but I'm shocked that Europress haven't extended *AMOS Pro's* screen handling facilities to cover ECS screen modes at least! Oh well, at least we can take refuge in the knowledge that thanks to *AMOS'* flexible extensions system, support for such things can be easily added simply by tacking on a new extension. Just imagine being able to write an *AMOS* game in AGA's new 256 colour VGA-like screen mode! Knowing Francois' enthusiasm for the Amiga, I'm sure it's only a matter of time before such an extension arrives.

AMOS' sound support commands have been extended a bit too, although many of the new commands surfaced previously in *AMOS* version 1.34 – *Sound Tracker* and *ProTracker* support, for example. One welcome addition though is direct support for MED-format compositions complete with full data send (providing the module has been set up to use MIDI). If you're lucky enough to own a synthesiser, you can now have your game sound tracks accompanied by high quality synthesised MIDI sound. Obviously you'll need a MIDI interface and some MIDI gear to take advantage of this facility, but it's nice to know that sound tracks are no longer restricted to the Amiga's four channels of internal sound. I would have liked to have seen support for 8-channel *OctaMED* tunes too, but then perhaps this is asking too much (8-channel soundtracks do tend to use up a lot of valuable processor time).

> **"AMOS Pro should be at the top of your shopping list, it's so easy to use"**

SO, WAS IT WORTH THE WAIT?

AMOS Pro has certainly been a long time coming, but it's been worth waiting for. As a software developer myself, the changes and enhancements present in *AMOS Pro* have made my life not inconsiderably easier. The new editor is a vast improvement over the original, making the process of writing *AMOS* code not only easier, but more productive.

Professional programmers need professional tools and Europress have certainly come up with the goods with *AMOS Pro* – since the day the first beta test version of *AMOS Pro* landed on my door mat, I've stopped using the original *AMOS* in favour of *AMOS Pro* simply because it's a more solid and more comfortable system to work with. Obviously I've had to use the original to compile my code, although Europress have assured me that a compiler for *AMOS Pro* will be released during February next year, or thereabouts. Personally, I can't wait!

Even if you are not a professional programmer, *AMOS Pro* should be right at the very top of your shopping list for one reason alone: it has remarkable power and an ease of use which is glaringly better than that of its predecessor.

Although it's still not the answer to everyone's programming requirements (it can't be used to write Intuition-based applications, for example), it's about as near to perfect as you're ever likely to encounter in this imperfect world. The original was pretty damned impressive, but *AMOS Pro* really does put it in the shade.

Whether you're a hardened coder or just a Sunday afternoon part-time dabbler, you'd be a fool to miss this one. Hold up a bank, sell your body, sell your granny's body – just do anything to get your hands on *AMOS Pro!* AS

screen display window. For larger projects, you can run the program at full speed with a full-sized screen display until you reach the section that you're interested in.

All that is then required is a quick 'Control C' and you're transported back to the monitor screen. From here on, you can monitor the flow of your program.

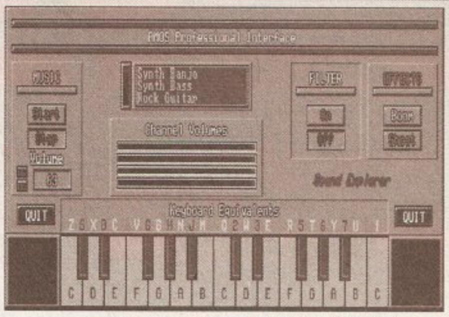
The monitor also provides a very useful expression evaluator function which, as the name suggests, is used to display the result of a given expression.

If, for example, you wanted to display the contents of a particular variable, all you'd have to do is to click on the 'VAL' gadget and then on the variable you're interested in and the content of the variable is displayed at the bottom of the screen. It would have been nice to have been able to edit a variable's contents too. Oh well, can't have it all.

AMOS INTERFACE LANGUAGE

Probably the most major addition to *AMOS Pro* is its all-new Interface language, an interrupt-driven system that makes the process of displaying and handling complex user interfaces a breeze (it alone accounts for most of *AMOS Pro's* new commands – there are over 100 in all!). Like AMAL, the Interface language contains its own subset of commands that run independantly (under interrupt) of your main *AMOS* code.

The similarities between AMAL and Interface don't stop there though. Like AMAL, Interface is controlled via mini programs that are held within your *AMOS* code as strings. The interface language allows you to code interrupt-driven gadget handling routines that make the process of building up screen displays simpler than ever before. All you need to do is to tell *AMOS Pro* where a particular gadget is to appear and the rest is handled for you. If the user then clicks on that gadget, a simple status check is all that is required to trap this. Even if the user clicks on the gadget at a time when your code is doing something else, *AMOS Pro* keeps its eye on the gadgets for you and informs you of gadget selections once your main program loop gets around to checking for them.



Key notes: complex user interfaces such as the one above are easy to create with *AMOS'* interrupt-driven interface language

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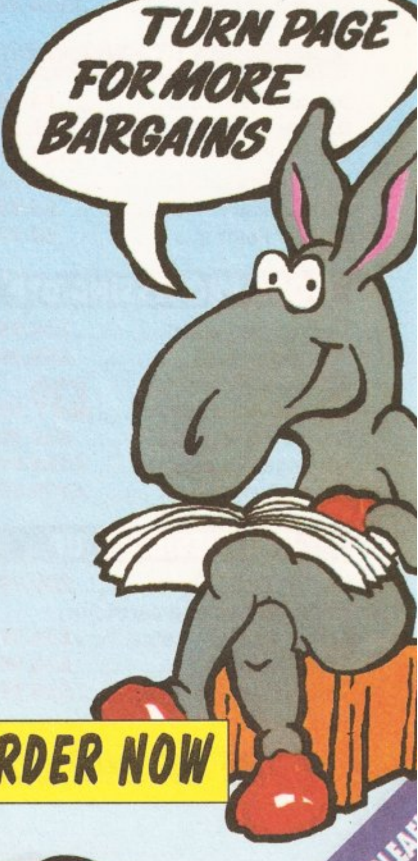
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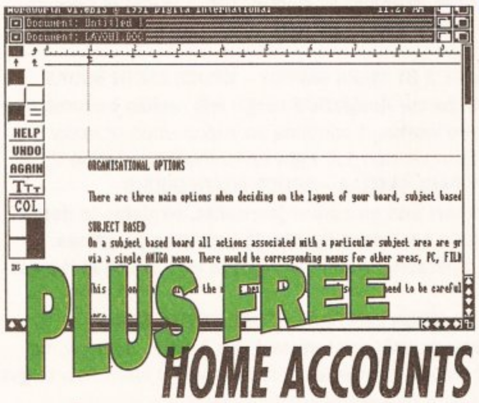
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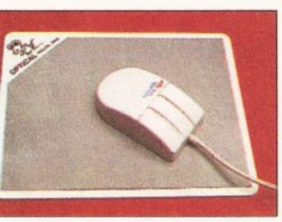
Digita's acclaimed *Wordworth* word processing package was first reviewed in issue 4, when Jeff Walker said: "Heavens, there's so much to the package." Since then it has been further improved. It comes with a spell checker, a thesaurus, an on-line help facility, and one of the best manuals we've ever seen. It also has a whole load of attractive fonts and, of course, excellent facilities for incorporating graphics into documents.

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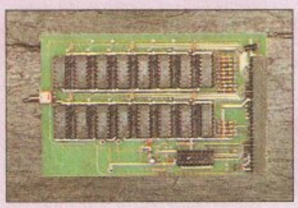
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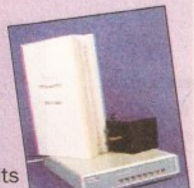


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INTERDIAL M5024 MODEM

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Connections Interdial M5024 modem	£299.95	CONN INT



This handy little modem will get you into the world of comms with a whizz. With MNP4 error corrections and MNP5 data compression, it will provide data transfer speeds of up to 4,800 bits per second.

HYUNDAI MODEM



The Hyundai modem is an excellent item for the beginner in comms. It has data transfer rates of up to 2,400 bits per second and supports the V21, V22 and V22bis protocols. You'll also need serial cable and comms software to get started.

DESCRIPTION	PRICE	ORDER
Hyundai HMD2401 modem	£99.95	HYUNDAI

TECHNOSOUND TURBO

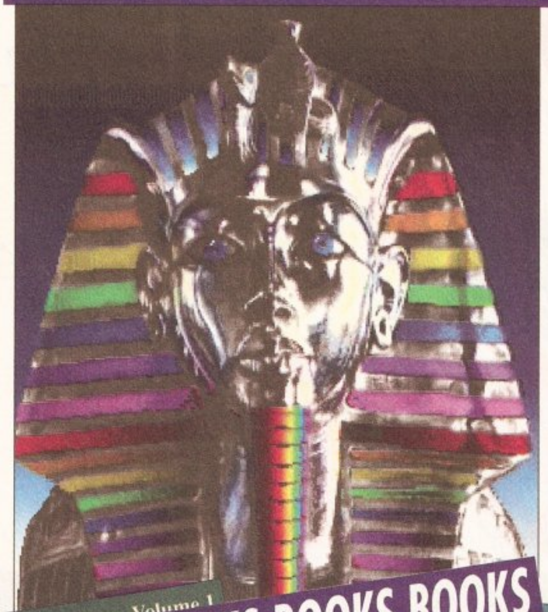
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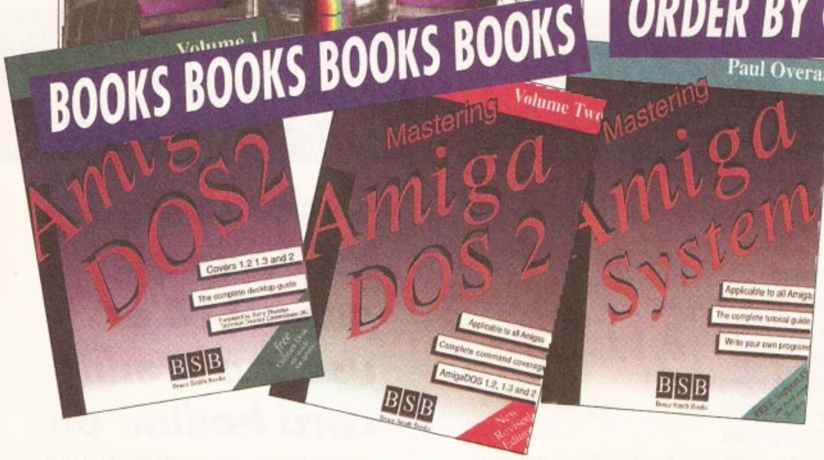
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MASTERING AMIGADOS 2 VOLUME 2 BY MARK SMIDDY – BRUCE SMITH BOOKS

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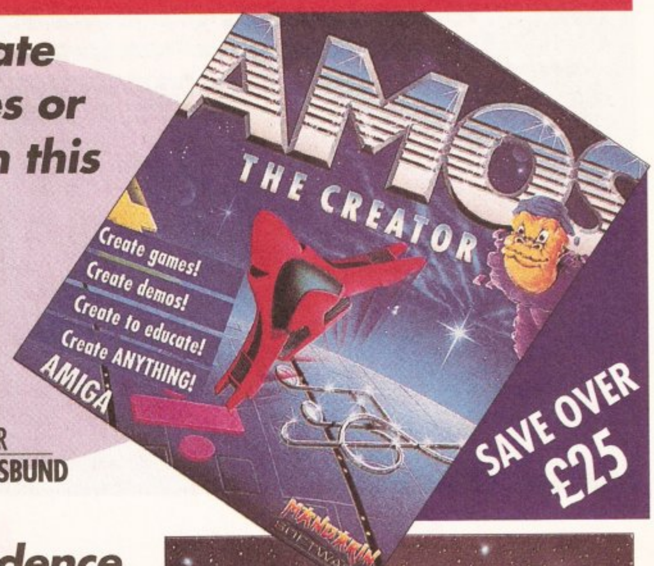
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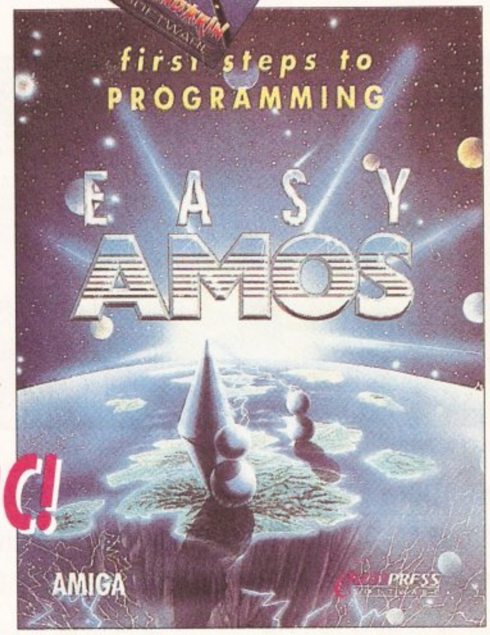


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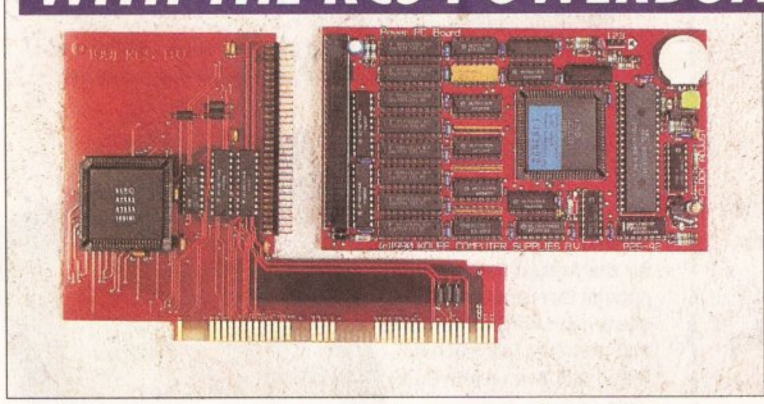
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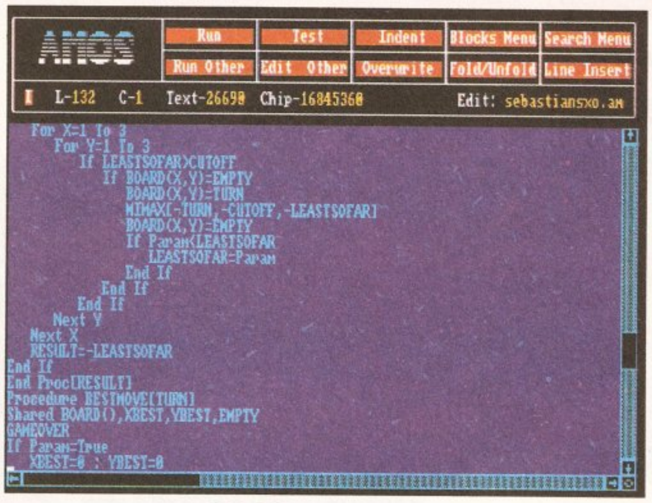
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AMOS

AMOS

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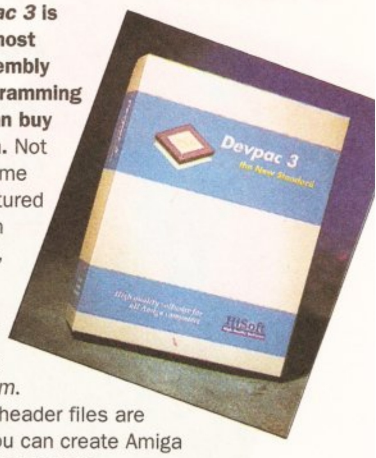
AMOS COMPILER

AMOS COMPILER

AMOS programs are pretty fast, but if you feel the need for even more speed, then the AMOS Compiler is for you. Your programs will become stand-alone applications, independent of the AMOS interpreter.

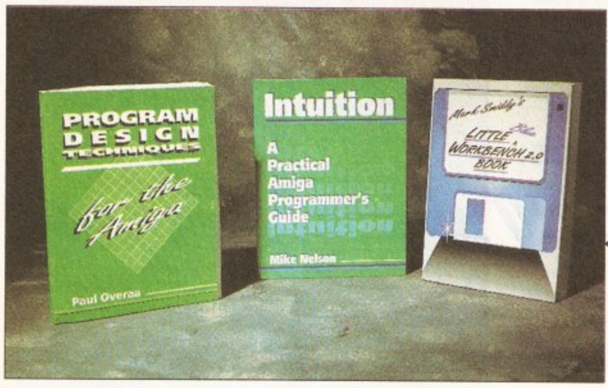
DEVPAC 3

HiSoft's *Devpac 3* is probably the most advanced assembly language programming system you can buy for your Amiga. Not only does it come with a fully-featured assembler with macro support, but it also includes HiSoft's editor and debugging program *MonAm*. Commodore's header files are supplied, so you can create Amiga applications immediately.



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INTUITION: A PRACTICAL AMIGA PROGRAMMER'S GUIDE BY MIKE NELSON – KUMA PUBLICATIONS
Use of Intuition, the Amiga's graphical interface, is essential for giving your programs that professional look and maintaining compatibility across different versions of the operating system. This book shows you how, with sections on screens and windows, communications, menus, gadgets and requesters.

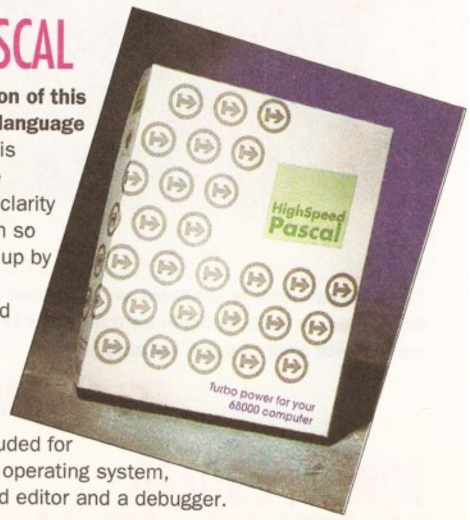
PROGRAM DESIGN TECHNIQUES FOR THE AMIGA BY PAUL OVERAA – KUMA PUBLICATIONS
If you've ever written reams of code only to find that it doesn't work and you can't find the bugs, then this book is for you. It shows you how to design your programs *before* typing them in, ensuring more reliable and efficient code.

MARK SMIDDY'S LITTLE BLUE WORKBENCH 2.0 BOOK – KUMA PUBLICATIONS
Mark Smiddy, probably one of *the* most knowledgeable Workbench gurus, brings you this guide to the Amiga's operating system. Handy tips include how to make a boot disk, how to set up a printer with the right driver, and how to customise your startup-sequence, with extensive examples.

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- *CABLE REQUIRED*
  See Accessories below

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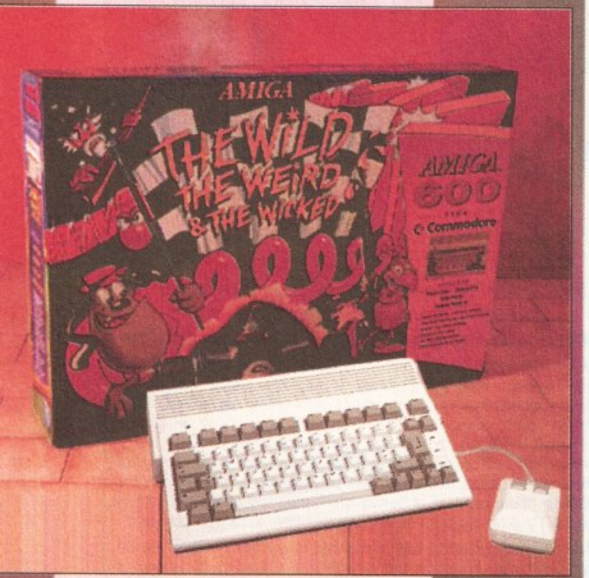
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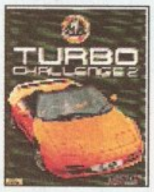


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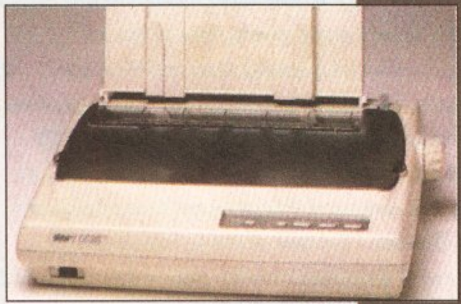
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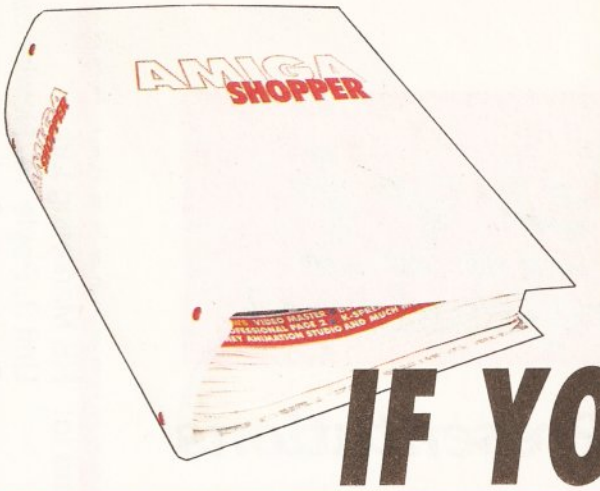
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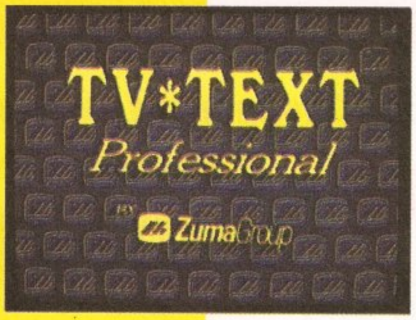
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A ROM of one's own

We kick off our new hardware series with a project to build a ROM switcher for less than the price of a public domain disk. Get that soldering iron warmed up and read on....

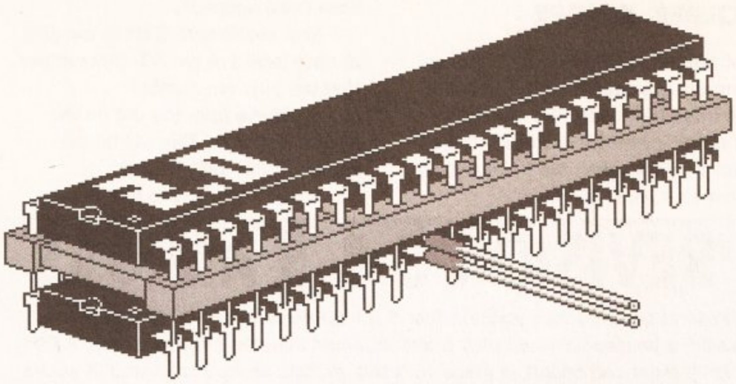


Diagram 1 – the design has the two Kickstart ROMs sandwiching a DIL socket in the middle. The two wires are used to switch between them

Our request for readers' hardware projects in issue 18 has met with considerable response. It's *Amiga Shopper*'s job to cater for its readers, and we're happy to oblige by starting a new series detailing exciting and useful projects you can build for your Amiga for far less than the cost of buying their commercial equivalents.

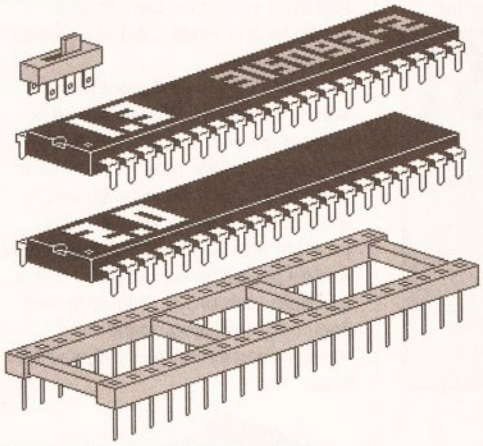


Diagram 2 – the four key parts to the project – the two ROMs, the DIL socket and a double pole single throw switch

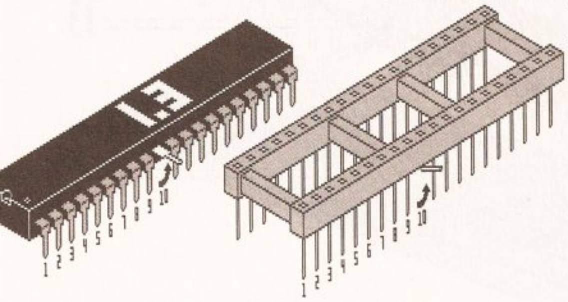


Diagram 3 – bend pin ten of both the 1.3 Kickstart chip and the DIL socket through 90 degrees

The series begins with an excellent and cheap ROM switcher from John King of Birmingham. Thanks for the submission, John; as promised we'll be sending you £70 for your efforts.

Workbench 2 is here to stay. Most everyone is agreed that it's a vast improvement over version 1.3, and the rush to upgrade has been phenomenal. Workbench 2 requires the new Kickstart 2 ROM to run correctly and, sadly, this has caused many people problems. A lot of software written with Kickstart 1.3 in mind will not work with Kickstart 2. Of course, software written now is done so with compatibility in mind, but many of us still have plenty of otherwise useful programs sitting around collecting dust because it won't work with our new set-up.

A solution that many third-party manufacturers have come up with is that of the ROM switcher. It does exactly as its name suggests: enables the user to choose whether to run the computer with the Kickstart 1.3 or Kickstart 2 ROM. These boards normally sell for somewhere in the region of £20, but John's design, by cutting out commercial overheads, can be built for under £1 (assuming, of course, that you already have both ROMs).

This massive reduction of cost does have a number of drawbacks that it's only fair to warn you about. Firstly, you can only switch between ROMs when the power is off; secondly, you may run into difficulties if there isn't enough space above your Kickstart chip (if, for example, you have an internal accelerator fitted to an A500); finally, a lack of care could result in damage to your chips.

THE ROMANTIC STORY

The design involves sitting one ROM on top of the other, with a chip socket sandwiched between the two. A fair amount of pin soldering is necessary to carry this out.

As standard, each ROM has a pin called CS (for Chip Select) which tells it whether or not its services will be required. Each pin on one ROM chip will be soldered to its equivalent on the other, except for the two CS pins which will be left free to allow us to choose which ROM to use.

By setting this pin on the Kickstart 2 chip 'low', and the equivalent pin on the Kickstart 1.3 chip 'high', the Kickstart 2 chip will be selected. The reverse is true for selecting the 1.3 chip. It's possible to damage the ROMs if both CS signals are the same, so the switch is wired in such a way as to make this impossible.

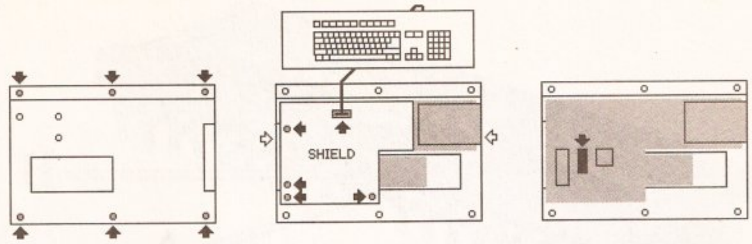


Diagram 4 – removing the case from an A500. First undo the screws on the underside, unplug the keyboard and then lift it and the metal shield away

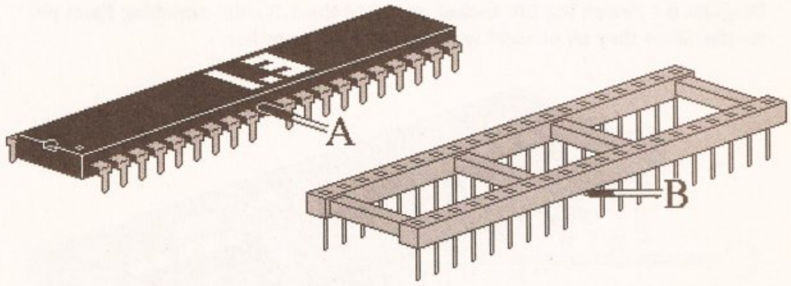


Diagram 5 – Attach a wire to pin ten of the 1.3 Kickstart ROM chip. Similarly attach a wire to pin 10 of the DIL socket

LET'S BE CAREFUL OUT THERE

Just a few words of warning before you embark on your voyage of electronic discovery:

- **Disconnect your machine from the mains throughout this project.**
- ***Amiga Shopper* accepts no responsibility whatsoever for damage caused by you to your machine as a result of following these instructions.**
- **Building this project requires you to remove the lid of your Amiga. Doing so will void your warranty, so proceed with caution.**
- **ROM chips are static-sensitive, so be sure to correctly earth yourself before touching them.**
- **ROM chips are heat-sensitive, so exercise extreme care when soldering. Don't let the soldering iron touch the ROM pins for more than three seconds.**

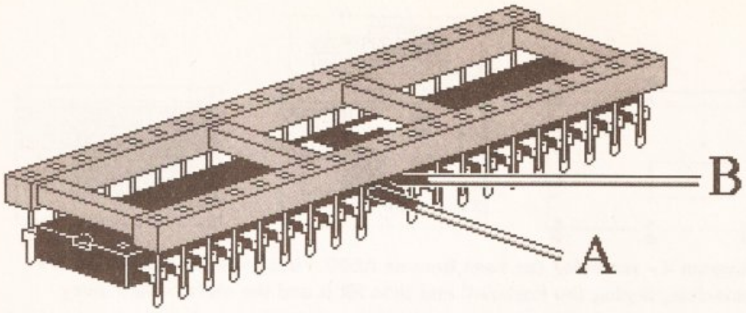


Diagram 6 – mount the DIL socket on top of the 1.3 chip, matching them pin for pin. Once they all contact well, solder them together

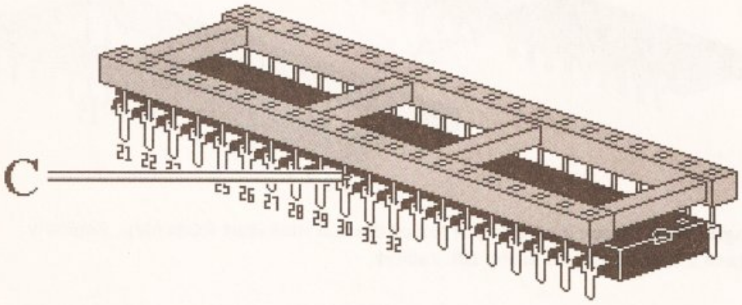


Diagram 7 – Now solder wire C on to the pins already joined at pin 30. This is the source of the 'high' signal

PREPARATION

Wires need to be connected to the CS pin of both chips. This is pin 10. Before you begin soldering, it is necessary to bend a couple of pins to make them accessible. Pin 10 (the tenth pin when counting anticlockwise from the dot on the chip) on the Kickstart 1.3 chip must be bent through ninety degrees so that it faces directly away from the chip itself. Be sure not to snap the pin.

In a similar manner, pin 10 on the DIL socket should also be bent. Do *not* bend any pins on the Kickstart 2 chip.

The next step is to open the case of your machine. Opening up an A1500/A2000 is a simple matter of removing screws at the side and back of the case and lifting away the top.

The case of the A500 is a slightly more complex one. Bear in mind that opening the case of an A500 will void its warranty.

To do so, undo the screws on the cases underside (shown with black arrows in the left-most picture of diagram 4). Then turn the machine the right way up and lever the two casing clips (shown by the white arrows in the middle picture of diagram 4).

Now lift off the casing top to reveal the keyboard and metal shield. Unplug the keyboard. Next remove the shield screws (shown by the black arrows in the diagram) and unbend the shield retainers. Take away the shield and you'll be able to see the Kickstart chip (which is shown by the black arrow in the third picture of diagram 4).

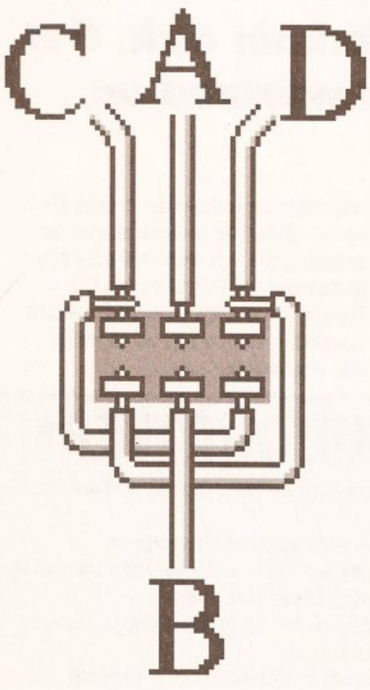


Diagram 8 – join the wires to the switch. Note that B and C connect the opposite way on the switch's other side

SOLDER, SOLDER

Cut four wires long enough to reach from the Kickstart chip to wherever you intend to mount the switch (preferably where it's unlikely to be thrown by mistake). We'll denote the wires as A, B, C and D.

Solder A to the bent pin of the Kickstart 1.3 chip. Solder B to the bent pin of the DIL socket. Cover them with some sort of insulation to guard against short circuits.

Next the DIL socket must be placed pin-for-pin on top of the Kickstart 1.3 ROM. Once you are satisfied that all pins are in good contact (aside from the two CS pins), solder them together carefully. Maximum contact time with the soldering iron should be no more than three seconds.

Now solder wire C on to the pins already joined at pin 30. (Remember that the pins are number anticlockwise from the dot on the ROM chip's top.) This will be the source of the 'high' signal.

Solder the wires to the double pole single through switch as shown in diagram 8. Notice how wires B and C connect the opposite way around on the other side of the switch.

Wire D can be bent into the pin 10 hole of the Kickstart socket on the motherboard to provide a 'low' signal for the switch.

Now you must fit the switch to the casing. Insert the Kickstart 2 chip into the DIL socket and mount the whole assembly into the Kickstart socket on the Amiga's motherboard. Finally, put your Amiga back together.

And that's it – job done! You should now find that your Amiga is compatible with just about any piece of software. Note though that some programs – notably some games – will still fail to work. This is not a problem with Kickstart but from badly written programs expecting to find a particular amount of Chip RAM and becoming confused. Aside from these malcontents, everything will be fine.

REVISION 3 & 5 AMIGAS

Those of you who own revision 3 or 5 Amiga 500s will have already had to install a jumper between pins 1 and 31 when installing the Kickstart 2 ROM. This jumper can be left in place with this switch, since Kickstart 1.3 works perfectly well with it.

YOUR DIY PARTS LIST

To complete the project, you will need the following items:

- **A soldering iron, some solder, and something to hold components while you are working on them.**
- **A pair of thin-tipped pliers and a Philips-head screwdriver.**
- **A Kickstart 2.0 ROM and a Kickstart 1.3 ROM.**
- **A 40-pin DIL (Dual In-Line) chip socket.**
- **About one metre of wire (thin solid-core wire is the best for this).**
- **A DPST (Double Pole, Single Throw) switch.**

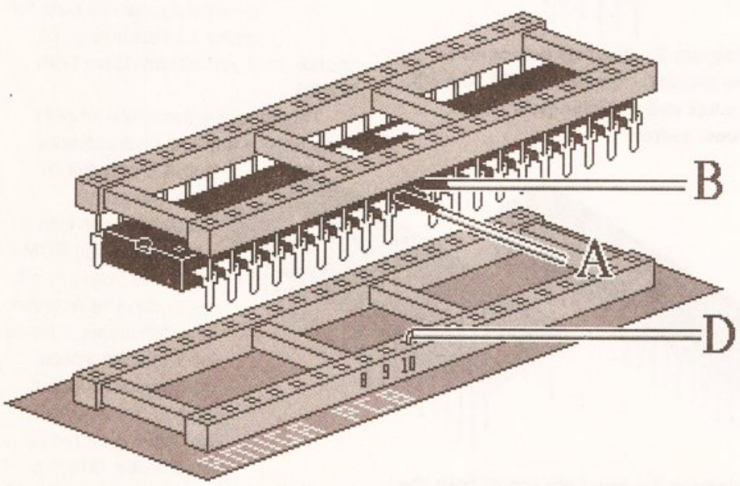


Diagram 9 – wire D is bent into the pin 10 hole in the Amiga's Kickstart socket, then the whole assembly can be fitted in

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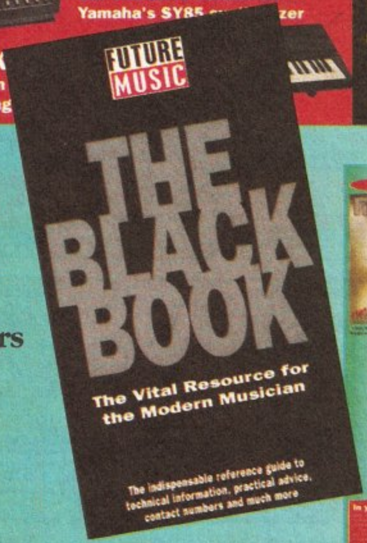
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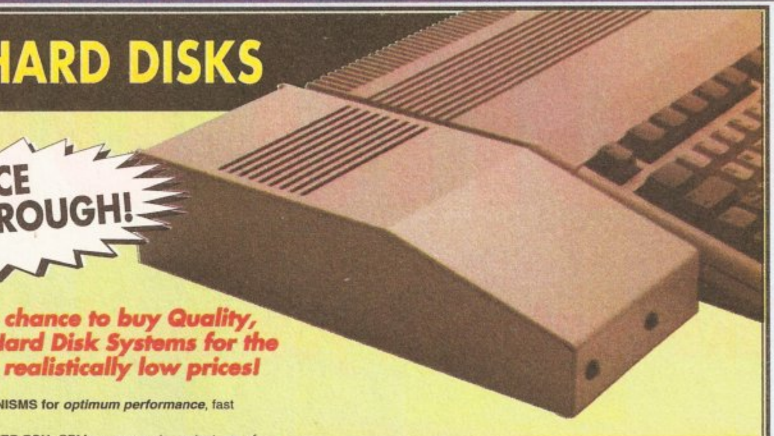
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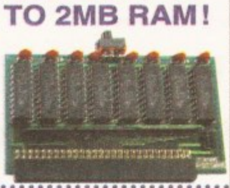
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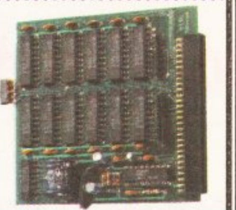
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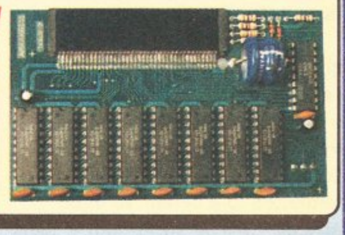
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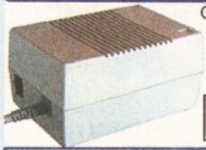
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LISTINGS LISTINGS

THIS MONTH: FORMATTING YOUR C PROGRAMS

Here's a neat utility written in C to take any C source code and indent it with a user-specified tab width. Remember: we pay £20 for any programs we publish

Pete Lockwood's program should find favour among C coders. Called *SCAN* (for Source Code ANalyser), it will indent any C source file it is presented with using a user-specified tab width. It's ideal for making programs that have nested loops, switch statements and decisions easier to read. And that, of course, means that it will be easier to track down bugs in them.

The program is written in C, and should be compatible with any C compiler and Amiga. It is run from the Shell or CLI by typing SCAN followed by the name of the file to be operated on. The result – formatted to a default of three spaces – will be saved with a '.sca' extension. The name of the output file and tab width can be changed using optional arguments in the following manner:

```
SCAN in_file out_file /tab
```

where 'tab' represents a number and 'out_file' is the name the output file is to be given.

For example, to format a file called 'mandel.c' with a tab spacing of 5 characters, and have the result sent to a the file 'mandel_pretty.c', you would simply enter:

```
SCAN mandel.c mandel_↵
pretty.c /5
```

Many thanks, Pete, for your entry. As happens to all those lucky souls who get their programs published in the Listings pages, you'll soon be receiving £20.

We're interested in submissions for any application in any language, but we can't print programs that rely on binary files.

Pop your program on an AmigaDOS disk (along with source code if it is compiled or assembled), include a written description and send it all to:

Listings
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```
/*  SCAN the Source Code ANalyser
(c)1992 Pete Lockwood   */
/* This version compiled 12/7/92 */
#include <stdio.h>
#define MAX 80
#define EOL 10
#define BON "\x9b""33m"
#define BOFF "\x9b""0m"
main(argc,argv)
int argc;
char *argv[];
{
```

argc and argv are used to pass arguments from the CLI to the program itself

First the program declares all of the variables it needs to use

```
  char filename[MAX],destname[MAX],↵
tmpdest[80],word[MAX],copy[10], ↵
tmp,tmp2=' ',fol;
  FILE *inf,*outf;
  short f,i,ignore_ret=0,got=0,↵
first,in_quotes=0,in_string=0, in_↵
comment=0,last=0,tested_word=0,length=0;
  int indent=0,single=0,width=3,↵
ignore=0;
  printf("\n%sS%source %sC%sode ↵
%sAN%salyser      ",BON,BOFF,BON,BOFF,↵
BON,BOFF);
  printf("(c)1992 Pete 'Jetman' ↵
Lockwood\n\n");
/* Sort out parameters.... */
  argc—;
  argv++;
  if(!argc || !strcmp("?",*argv))
```

If the user has typed a '?' as an argument, then a list of the expected arguments is given

```
  {
    puts("Use:   SCAN <source> ↵
[destination] [/tab width]");
    exit(0);
  }
```

The arguments supplied from the Shell command line are processed one by one. The first is the name of the file to be formatted. The program also uses this name with the suffix of 'sc1' as a temporary file

```
  strcpy(filename,*argv);
  strcpy(tmpdest,*argv);
  strcat(tmpdest,".sc1");
  argc—;
  argv++;
  if(argc && *argv[0]!='/')
  {
    strcpy(destname,*argv);
    argc—;
    argv++;
  }
  else
  {
    strcpy(destname,filename);
    strcat(destname,".sca");
  }
  if(argc &&
*argv[0]=='/')
  {
    strcpy(copy,*argv);
    i=width=0;
    while(copy[++i])
    {
      width*=10;
      width+=copy[i]-48;
    }
  }
```

If a '/' has been entered as an argument, then the following characters are converted into the number of spaces to be used as a tab

The source and temp files are now opened, ready to be processed

```
  if(!(inf=fopen(filename,"rb")))
  {
    puts("Source file not found!");
    exit(0);
  }
  if(!(outf=fopen(tmpdest,"wb")))
  {
    puts("Could not open temp file - ↵
aborted!");
    exit(0);
  }
  printf("Tab width:%s%d%s\n",↵
BON,width,BOFF);
```

The file is actually processed twice – this is the first time through...

```
  printf("Preprocessing %s%s%s\n",↵
BON,filename,BOFF);
  while((tmp=getc(inf))!=EOF)
  {
    first=0;
    if(!got && tmp!=32 && tmp!=9)
    {
      first=got=1;
    }
    if(got)
    {
      if(!tested_word)
      {
```

If the next character read from the file is alpha-numeric, then it is added to the string 'word'

```
        if(tmp>='a' && tmp<='z')
          word[length++]=tmp;
        else
```

Otherwise the string is terminated with a '0'

```
        {
          word[length++]=0;
          tested_word=1;
          if(!ignore)
```

Check to see if the string in 'word' corresponds to a variable declaration

```
          {
            if(!strcmp(word,"int") ||↵
            !strcmp(word,"double") ||↵
            !strcmp(word,"char") ||↵
            !strcmp(word,"long") ||↵
            !strcmp(word,"register") ||↵
            !strcmp(word,"unsigned") ||↵
            !strcmp(word,"short") ||↵
            !strcmp(word,"struct") ||↵
            !strcmp(word,"float") ||↵
            !strcmp(word,"union"))↵
            {
              ignore=1;
              fputc(1,outf);
            }
          }
        }
      }
      if(tmp==10)
        length=tested_word=0;
      if(!in_quotes && !in_string)
      {
        if(!in_comment)
        {
```

If the previously checked character was a slash and the current one is an asterisk, then what follows is part of a comment and should not be formatted

```
          if(last=='/' && tmp=='*')
            in_comment=1;
        }
        else
```

If, on the other hand, an asterisk is followed by a slash, then a comment has come to an end

```
        {
          if(last=='*' && tmp=='/')
            in_comment=0;
        }
      }
      if(!in_comment)
      {
        if(!in_quotes && tmp=='"')
          in_string=(!in_string);
        if(tmp==39 & !in_string)
          in_quotes=(!in_quotes);
      }
      if(tmp==10)
        got=tested_word=length=0;
      if(!in_quotes && !in_string && ↵
!in_comment && tmp==';')
      {
        if(ignore)
          fputc(2,outf);
        ignore=tested_word=length=0;
      }
      if(in_quotes || in_string || ↵
in_comment || ignore)
        fputc(tmp,outf);
      else
      {
        switch(tmp)
        {
          case('{'):
          {
            fputc(tmp,outf);
            fputc(10,outf);
            ignore_ret=1;
            got=0;
            break;
          }
          case('}'):
          {
            if(!first)
              fputc(10,outf);
            fputc(tmp,outf);
            fputc(10,outf);
            ignore_ret=1;
            got=0;
            break;
          }
          case(10):
          {
            if(!ignore_ret)
              fputc(10,outf);
            ignore_ret=got=0;
            break;
          }
          default:
          {
            fputc(tmp,outf);
            ignore_ret=0;
          }
        }
      }
    }
    last=tmp;
  }
```

The first pass is complete. Both the input and output files must now be closed. The previous output file will now be opened for input, while the final destination file will be opened for output

```
  fclose(inf);
  fclose(outf);
```

Now for the second pass through – this time taking input from the previously created temporary file and sending results to the final output file

```
  ignore=0;
  inf=fopen(tmpdest,"rb");
  if(!(outf=fopen(destname,"wb")))
```

We can only proceed if the destination file can be opened

```
  {
    puts("Could not open destination file
- aborted!");
    exit(0);
  }
  printf("Writing %s%s%s\n",↵
BON,destname,BOFF);
  while(!feof(inf))
  {
    fol=tmp=getc(inf);
    if(!ignore)
    {
```

The following segment checks for an open or closed brace. If one is found, the variable governing the number of tabs to be employed is modified accordingly

```
      if(single && tmp !='{')
        indent++;
      if(tmp=='}')
        indent--;
    }
    if(tmp==2)
      ignore=0;
      if(fol!='#')
      {
```

Now we convert the number of tabs to actual spaces in the output file. The number of spaces to be used is obtained by multiplying the 'indent' variable by "width", which holds the user-specified tab width.

```
        for(f=1; f<=indent*width; f++)
          fputc(32,outf);
      }
      if(tmp !=EOL)
      {
      if(tmp>2)
        fputc(tmp,outf);
      if(tmp!='}')
        tmp2=tmp;
      else
        tmp2=' ';
      while ((tmp=getc(inf))!=EOL && ↵
tmp!=EOF)
      {
        if(tmp==1)
          ignore=1;
        if(tmp==2)
          ignore=0;
        if(tmp!=32 && tmp>2)
          tmp2=tmp;
        if(tmp>2)
          fputc(tmp,outf);
      }
      if(ignore)
        single=0;
      else
      {
        if(tmp2=='{')
        {
          single=0;
          indent++;
        }
        if(single)
        {
          single=0;
          indent--;
        }
        if((tmp2==')' || tmp2=='e' || ↵
tmp2==':') && fol!='#' && indent!=0)
          single=1;
        if(tmp2=='}')
          indent--;
      }
    }
    if(tmp2!=EOF)
      fputc('\n',outf);
  }
```

All the processing has been done, so now all that remains is to close both the input and output files

```
  fclose(inf);
  fclose(outf);
}
```

Some program lines have to be split because of our column width. If you see the symbol '↵', don't split the line when typing in the program, rather treat the two lines it separates as one long one.

Watch out for the double symbols '--' and '==', both of which can easily be mistaken for their single counterparts: '-' and '='



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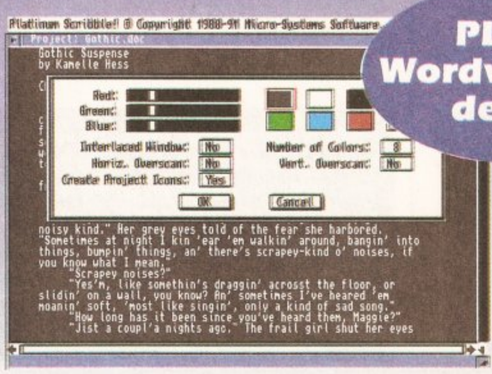
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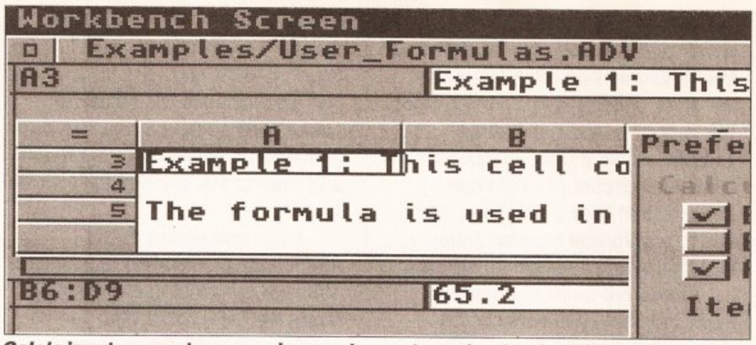
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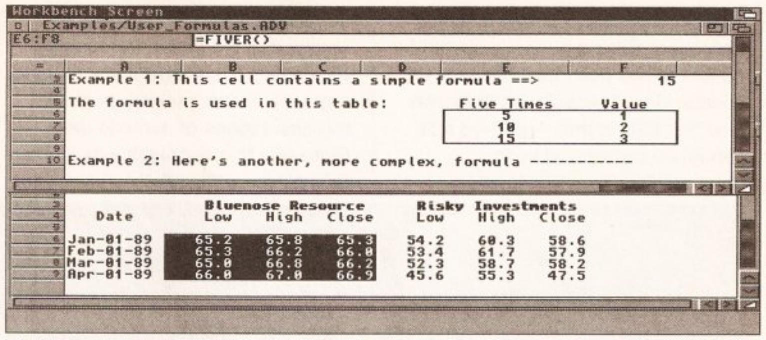
Send to: HB Marketing Ltd.,
Unit 3, Poyle 14, Newlands Drive,
Colnbrook, Berks., SL3 0DX

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Calc's input requesters are clear and easy to understand — the preferences request is a typical example



Calc has a very clear display — even when several windows are being displayed you can see what's going on

BY *all* ACCOUNTS

Gold Disk's original Home Office was greeted with near universal acclaim – now comes the sequel, but was it worth the wait?

Just as happens in the cinema so often these days, people are scared to let go of a good idea; or at least, an idea that netted a few million. Software companies are pretty good at that – continuously updating their software to run better and faster with more features. Gold Disk is no exception. The original Office pack featured a good word processor *(Transcript)*, wonderful spreadsheet and graphics system *(Advantage)*, average database and the *Pagesetter* DTP system – enough said about that. Home Office 2 comprises much the same selection, although all the modules have been updated with Workbench 2 'look and feel' plus more features.

Office 2's format is the same as its predecessor: you don't get a front-end menu system. Instead, the programs are supplied on four separate disks. Personally I prefer the wholly integrated approach taken by *The Works*, as the integration is more transparent and, since a shared function library is used, the programs can share similar features – the database has most of the spreadsheet functions for instance.

Even so, the programs found in Office are good examples in their own right: even if they are just partly modified versions of Gold Disk's commercial offerings. At least the system understands Workbench 2 – rather than just duplicating it graphically. This is demonstrated as the program uses the standard Workbench 2 file requester when used on a Workbench 2 machine and its own when used on an older model. A good level of ARexx support is available in the spreadsheet and database so Workbench 2 users and people who have purchased ARexx separately can enjoy the extra benefits therein. An art college lecturer told me recently how much he enjoyed using ARexx, "I use Macs at work, and I've been able to write lots of genies [ARexx macros] to make Pro Page work like Quark XPress." he said.

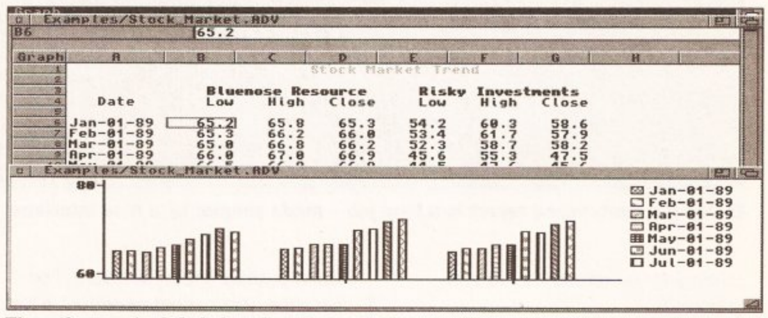
Although most applications will run faster with Workbench 1.3's, FastFonts-activated Office programs run a respectable speed on their own. (Fastfonts is supplied with all Amigas between 1.3 and 1.3.3 but cannot be re-distributed by other developers. So you should boot from a copy of your original Workbench disk to get the best from these applications.)

> "Icons are the in thing and much easier for the mind to assimilate..."

SPREADSHEET

The spreadsheet and separate graphics modules are based on Michael Tordovic's amazing *Professional Calc* – also supplied by Gold Disk – and at first glance you could be forgiven for thinking the two are one and the same. I would hedge bets, the spreadsheet module is actually an early version of *Professional Calc* – since it feels like *Advantage* with Workbench 2 graphics added. Ease-of-use features such as the toolbar (ribbon) have gone, as has the ability to use large fonts inside the spreadsheet. But for all that, much of *Professional Calc's* power has been retained – albeit in two separate modules: *Calc* and *Graph*.

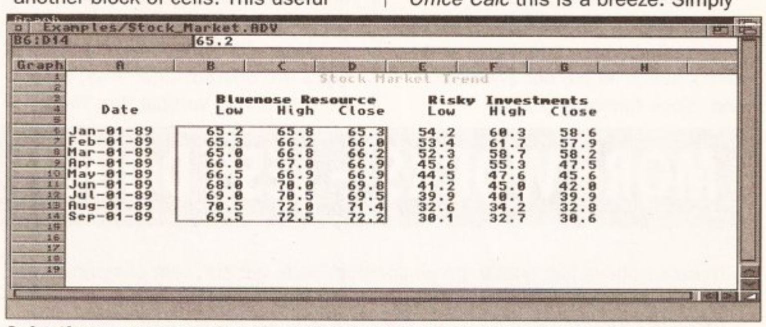
Calc is the spreadsheet proper: from here you can harness all the features you might expect from a professional spreadsheet. It's fast and quite economical on memory – even on a 1Mb machine it is possible to have multi-task *Calc* and *Graph* together (which is often necessary as you will see later). In an ideal world, of course, a machine used for anything but playing games should have more that 1Mb. Some degree of integration shows in that *Calc* supports extended cell notes by linking directly with *Write*.



The other part of *Calc* handles the graphics. Here stock market trends are being mapped on a bar chart — maybe a HiLo would be better?

Editing is simpler than with *Advantage* since the program always pastes relative cell addresses unless you ask it otherwise: this was an option in *Advantage*. Also, one cell (or a block of cells) can be pasted to another block of cells. This useful feature, allowing a formula or value to be replicated across an entire sheet was not previously available in *Advantage*.

To see how this works, imagine you have the simple formula "=A4" in B6 and you want to duplicate that across an entire row, where the contents of C6 are "=B4", D6 is "=C4" and so on – such things are quite possible. In Advantage this operation was a tiresome set of Cut and Paste Relative operations, in *Office Calc* this is a breeze. Simply copy B6 to the clipboard (Right Amiga - C) drag across the row where you want the formul> to appear and press Paste (Right Amiga - V).



Selecting a range to chart is a simple as dragging the mouse and clicking a button!

Calc does not have the database facilities found in either Advantage or

Professional Calc, but this is hardly necessary since a perfectly adequate database has been included with the bundle. One disappointing omission *in Office Calc* is that negatives still cannot be highlighted by the program. This question is often asked by *Advantage* users, so here's how to do it. Identify the values you expect could go negative (usually a row of final totals) and, for the sake of example, let's assume you wanted to flag negative values in the row A26lJ26. Now enter this formula (changing the references to suit yourself):

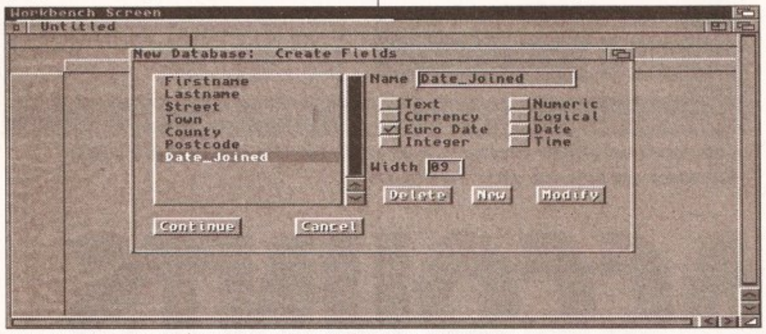
```
=SETCOLOR(A26>=0,1,3,A26)
```

Now copy and paste that formula relative to all places where you require negative values highlighting. Using the values shown on a four colour screen, negatives show are displayed in grey.

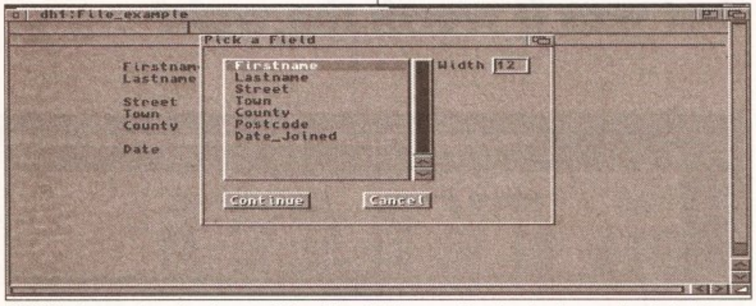
Graph has most of the spreadsheet's formatting with some important changes: the macro and ARexx functions are not available and, since formulae are not supported, there is no option to recalculate the sheet. Put simply, this makes the program unusable for any work except making graphical representations of numeric data. Quite why this approach was chosen is unclear – although it is something of a nuisance when charting constantly variable data. I would have preferred one program which did the whole lot.

As data graphing packages go, *Graph* is harmless enough – but it lacks any of the all-singing facilities found in tailor made software. For instance, you cannot construct a bar chart of fruit where each bar is made up of little fruit icons. Such applications may appear esoteric or even downright obscure – but they can be very handy when it comes to charting statistical data for multi-media presentations. Icons are, after all, the "in-thing" these days – and much easier for the mind to assimilate than numbers, words and coloured bars.

Many different conventional chart types are offered: Line; Area; Step; Horizontal and Vertical Bar; Hi-Lo; Pie; 3D Pie and 3D Bar. Like *Advantage,* the chart type is selected from a simple iconic requester. But the chart options selection still takes the form of buttons and string gadgets. Given the time elapsed since its inception, I would have thought Gold Disk would have altered this to a graphical representation too: this is one-strength *Mini Office.*



Creating the initial file definition in *File* is very simple...



Building a customised report is a long job – made simpler by a nice interface

Charts are quick to draw and many different data sets can be drawn on the same display – Chip memory allowing. However, the automatic label range selection, although simple for first-time users, is still limiting for the more experienced. Once again, why can't some developer get hold of the idea Might it not be useful occasionally to have more than one chart on the same axis set? Although every major spreadsheet on every other platform I have used can do this – none on the Amiga can. While multiple chart windows are useful, there's nothing quite like the ability to overlay, say, a line over a bar chart to press home a point. In multi-media presentation this could be essential.

DATABASE

The *Office 2* database *(File)* is a great improvement on the original. It now boasts a completely new front-end and much better features – although it remains a flat-file affair. Basic field types are as follows: text; numeric (integer or float); time; date (European or international); currency and logical (on/off). Extended options for the field types are limited to just the width. *File* isn't *Superbase* by any means – but this is a good selection for general purpose use and it doesn't overcomplicate matters. Being a disk-based system, the database files can contain over 32,000 records with 256 fields per file and 254 characters per field – although I doubt anyone would want that many.

Once created, the database looks rather like a simple spreadsheet on screen. Record numbers are shown down the left-hand side in the default mode with field names across the top. Like a spreadsheet too, a block of records can be selected by dragging the mouse. The default "browse" mode is quick, clear and easy to use – but File also includes the facility to "paint" entry screens too. The report generator is similarly simple to use and reports are automatically saved to disk.

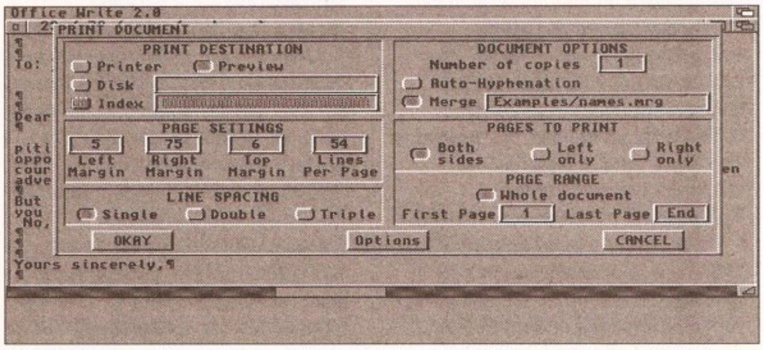
A comprehensive set of mathematical functions is included, although the most useful functions (sum, average, count etc.) can be accessed directly from a menu. Filters and indexes are similarly saved to disk for later use, so there is no restriction on the number of these which can be defined for any file. Unlike *Superbase,* filter and index calculations must be entered manually, which is a drag, but acceptable for the price.

It's not all perfect though: one annoyance is the way *File* quits when the last open database is closed – even closing a user-defined "view" does this. An "Are you sure?" request should have been included here. Also, editing the field definitions is difficult and confusing. These cavils aside, File is a neat little database which will fulfil the needs of most users.

WORD PROCESSOR

The original Office pack contained *Transwrite,* and the latest version has done much the same with a stripped-down version of *Transwrite* 2. Stripped down it may be, but there is little doubt it is a deceivingly powerful word processor in its own right. *Write* can be used in one of two ways: either as a text engine for *Page* or as a word processor in its own right. Just to give some idea of its flexibility, *Write* has headers and footers, handles widow and orphan control, has complete indexing facilities, automatic hyphenation and a mail-merge to boot. Mail merge files can be created using *File* or directly entered as a *Write* document.

Getting into *Write* from day one is as uncomplicated as the program itself. New users can just sit down and start typing straight away, without any need to refer to the manual. Getting the most from the



The print requester looks complex at first — but it's logical and well laid out

MORE WORKS – LESS DOUGH

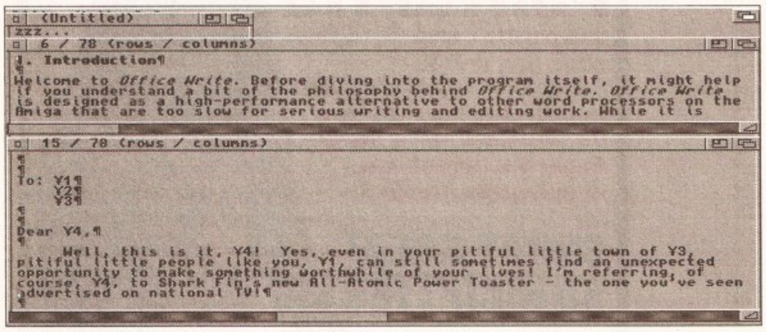
There's nothing like a little (good) competition to get software companies re-thinking their pricing policy is there? Shortly after Europress released *Mini Office* at £59.95, Micro Systems Software reduced the price of *'The Works! Platinum'* from over £90 to £59.95 inclusive of VAT. Pound for pound, although the Europress offering looks better, the MSS system is far and away a better buy. In my opinion, *The Works* was pretty good value as it stood – the higher price merely reflecting the better feature list. Nevertheless, an HB Marketing spokesman commented, "Since the price dropped, Works has been flying out of the door." There you have it:there's nothing like a bargain to make the public open its collective wallet.

program will require a little more effort, of course.

Perhaps *Write's* only limitation is that documents are held entirely in memory, and while the program is actually quite small (170K), large documents will use up memory very quickly. The only time this may become troublesome is when indexes are being created – and these are typically used for big documents. The program has an intelligent index: any reference has only to be marked once in any file – far simpler than the Macintosh's £300 *Microsoft Word!*

However, several related files (chapters in a book or report) will each require a new set of index codes. Once created, the index is automatically sorted by *Write.* This could give rise to a situation where several indexes have to be joined and sorted by AmigaDOS, then manually edited. But this is unlikely to be a big problem for most users.

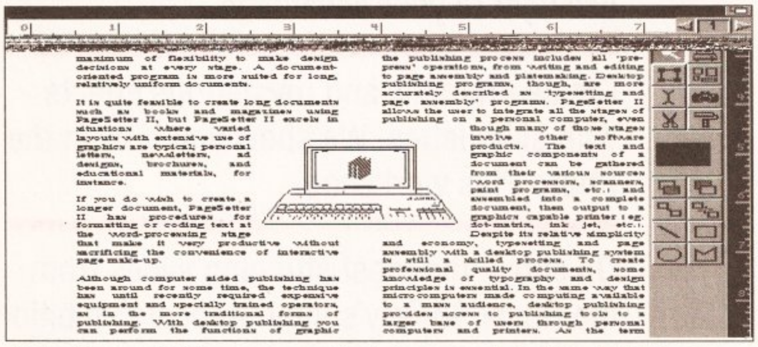
As a word processor it follows similar design concepts to that of Protext and Scribble – basic formatting is WYSIWYG, but more complex operations (headers, footers, page numbers etc.) are handled with little control sequences dropped in the text. In this instance a little on-screen help would be nice: as it is you have to keep referring back to the manual. One last point – why, oh, why is the print shortcut right-Amiga K? P is reserved for paste – even though it has long been convention to use V. Oh well.



Mail-merge doesn't come much simpler than this — and *Write* even gives you a high-speed preview to screen

DTP

The Amiga has never been viewed as a machine for serious DTP. Gold Disk disagree with the pundits and continue to support and uprate products such as *Professional Page* and the budget version, *Pagesetter. Page* in Office 2 is basically *Pagesetter 2,* so any comments my colleague Jeff Walker has to say about it will also apply here.



***Page* allows multiple columns and text flow around graphics but it *is* slow…**

Page is neither sold as nor intended for power DTP, such as producing books or magazines. It is meant as a simple tool to create flyers, newsletters and so on – simple stuff. Nevertheless it contains a lot of powerful tools for manipulating documents and as such it is the perfect complement to *Write.* Just in case you prefer another word processor, it supports *Word Perfect, Scribble, Textcraft* and *Textcraft Plus.* The internal word processor is limited and weak to the degree of being infuriating. Just for openers, it is not possible to drag-select text backwards – a basic function if ever there was one!

Once that annoyance has been overcome, *Page* does at least support Agfa's Compugraphic fonts. These give high-resolution images at the maximum resolution of the printer or display – however, Gold Disk supply just one (Times) with *Page.* Surely they could have stretched to at least one sans-serif face such as Helvetica too? Extra fonts are available as an option – but they don't come cheap as a rule. Several bitmapped fonts are there including Zapf Chancery, Courier and Helvetica, but it would only be the bold or foolish to mix those with Compugraphic outlines.

I can report that the interface is a great improvement over its predecessor and must concede the refresh rate is acceptable if nothing special on an un-accelerated 1.3 machine. Users with more powerful models will see their money well-spent here. Getting to know *Page* is not a problem if you've never used a DTP system before and do not know what to expect. If, however, you're used to the likes of *XPress,* then treat it as a nice extra.

CONCLUSION

Gold Disk has done it again! *Office 2* is indeed a worthy successor to the original and contains almost everything you could want from a power user's system. A difficulty arises when comparing it to similar bundles like *The Works* or *Mini Office* because each has a slightly different set of goals. Office will find a welcome where DTP is a deciding factor. Neither *Mini Office* nor *The Works* can offer that. However, one other factor which should be considered is price – and *Office* currently costs around 30 per cent more than either of those.

The main functions of a business bundle should be a word processor, database and spreadsheet – and it is on the strengths of those which it should be judged. Anything else – DTP, disk utilities and communications packages are but icing on the cake. Judged on these terms only, *Office's* database and spreadsheet are beaten by Platinum Works; there's little to choose between the three word processors – all do more or less the same things. *Works Platinum* and *Mini Office* word processors do handle graphics to a degree, but *Office's* wordprocessor is better overall. Clearly a lot more investigation is needed to decide which of these is best, so I'll be doing a complete run down next month. AS

UPDATE – WORDWORTH 2

Showing on a computer screen near you soon will be *Wordworth 2,* the long awaited upgrade of Digita's acclaimed document processor. There's a long list of improvements to the package, both internal and external, but the most important two are column support and Intellifonts. This will allow *Wordworth* to produce large-size, high-quality printing even on low-cost dot-matrix printers – something it was not previously capable of. According to Digita, columns have been included at the request of over 2000 registered users responding to their survey. Upgrade costs are very reasonable (as usual from Digita) and the program should be on display at the forthcoming Future Entertainment Show (at Earls Court, November 5-8).

SHOPPING LIST

Home Office 2 .... £tbc
by Gold Disk Inc
PO Box 789, Streetsville
Mississauga, Ontario, Canada L5M 2C2

Distributed in UK by:
HB Marketing, Unit 3, Poyle 14,
Newlands Drive, Colnbrook,
Slough, Berks SL3 0DX
☎ 0753 686000

CHECKOUT HOME OFFICE 2

Speed
Spreadsheet ●●●●●
Blinding!
Database ○●●●●
Very respectable thanks to indexed system
Word Processor ○●●●●
An acceptable text engine – better on Plus machines
DTP ○○○●●
Slow! You'll need a faster machine for this one

Functions
Spreadsheet ○●●●●
Lots of them to play with and ARexx too!
Database ○○●●●
Slightly limited – the report generator is handy
Word Processor ○○●●●
Not Protext – but what can rival that?
DTP ○○●●●
Barely average – but enough for simple jobs

Ease of Use
Spreadsheet ●●●●●
Clean, clear and esay to live with
Database ○●●●●
Easy to learn and simple to use
Word Processor ●●●●
Separate spelling checker is a drag
DTP ○○○●●
Restricted mainly by low speed and poor interface

Overall
Spreadsheet ●●●●●
Superb – almost makes Office worth the money in itself
Database ○●●●●
Not Superbase – but useful in its own right
Word Processor ○○○●●
Room for improvement
DTP ○○●●●
Acceptable for a bundled product

Wilf Rees explains how to convert a CAD image into a full blown ray tracing using X-CAD 3000 and Imagine 2. Plus: a new way of learning a lingo with Audio Gallery Picture Dictionary

LET THE CAD OUT THE BAG

In the complex world of engineering design, CAD, or Computer Aided Design, is now dominant as the principal means of developing design solutions. Our major engineering companies use immensely sophisticated CAD packages, usually based on mainframes, to resolve material and manufacturing requirements. Indeed the involvement of computers in the realisation process does not stop there. CAM, or Computer Aided Manufacture means that components can be drawn on screen. The data can then be sent to lathes, milling machines, presses and other manufacturing machinery to engineer the required components to precision tolerances, previously carried out by technicians on a repetitive, laborious production line.

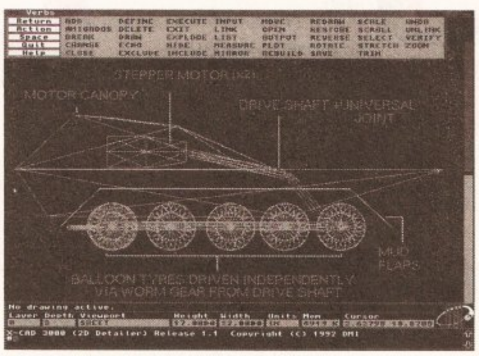
Beyond the design and component manufacture stages, we now find vast sections of assembly can be directly performed by robotic devices, eliminating quality control fluctuations, and reducing labour costs.

BRAVE NEW WORLDS

The same processes are available to us on our Amigas. Following on from my two part article on 'Control' I am going to demonstrate the very sophisticated facilities offered by two packages in another two part series. The two packages are *X-CAD 3000* and *Imagine 2*, both available from DM Services on 0702 206165.

X-CAD 3000 is without doubt the most comprehensive CAD package available for Amiga owners. Used extensively in industry, it can show many of its hugely expensive big brothers a clean set of heels. *Imagine 2* is quite simply a revelation to use. Certainly my favourite ray-tracing package, it offers speed and facilities way beyond its competitors. The magic lies in bringing these two giants together. *X-CAD* has a facility for porting designs into *Imagine* so that it can then process the image to produce a beautiful simulation of the finished object in anything up to 24-bit graphics.

To illustrate this process of design through to manufacture, I've decided to show how it is possible to build a vehicle which will be capable of climbing an ever elevating slope, negotiating an assortment of obstacles, and collecting uselessly improbable objects such as ping-pong balls, drink cans or cotton reels. All this will be possible with a configuration of the SDT teacher's favourite materials – Lego, perspex, balsa wood, welding rod and electric motors.



Drawn in *X-CAD 3000*, this is my design for a hill climbing vehicle. The extensive options available are visible along the top menu window

Planning complete, we can set about drawing our design into *X-CAD*. In the illustration above you can see my design for a climbing device. Along the top of the shot you can see the options available in *X-CAD* for producing the various drawing tools. Accuracy in this package is incredible, down to one millionth of a millimetre with scaling virtually unlimited. *X-CAD 3000* comes with 2D and 3D drawing capabilities – and the outcomes can be edited mercilessly.

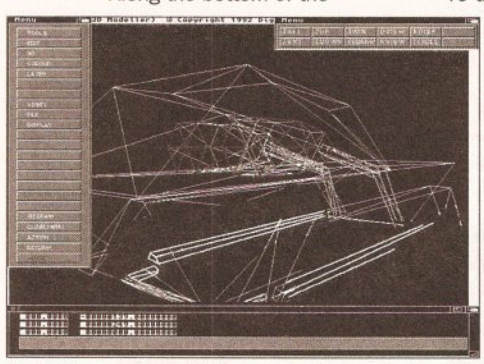
Newcomers might find the procedures for drawing in *X-CAD* a little cumbersome. Entering commands into *X-CAD* requires a sequence of events which follow a set procedure:

Verb	Noun	Identifiers
(*draw*)	(*line*)	(*location*)

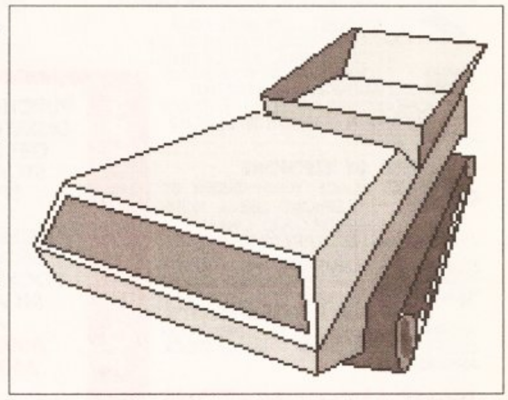
All of these functions can be mouse activated, but I found typing the commands quicker – of course this depends on how many fingers you use!

Along the bottom of the illustration above you will see the keyboard input facility. As you can see, an extensive range of options are available. This is where commands are directly entered. Once familiar with the system, however, inputting data can be quite quick and construction of a drawing gains pace rapidly.

There are an unbelievable 100,000,000 available layers in *X-CAD 3000*, so complex designing can be customised to suit needs.



This time we have *X-CAD 3D* and the rotated view of the vehicle to demonstrate the transmission and motor location



A visual outline of my vehicle drawn with *DPaint IV*. Not much detail is required in the early stages

X-CAD 3D

Along with the professional package comes *X-CAD 3D*. Again the facilities available are endless – keyboard or mouse data entry, verb-noun-modifier commands, automenus which change according to user usage, display menus, 2,000,000 layers available, 2,000,000 available user definable views, 2,000,000 construction planes, wire-frame or 'surface drawing', meshing and rendering from a single light source.

To the left, we can see our hill climbing vehicle viewed from an angle which permits viewing of the simple transmission I've designed and the configuration of the final drive. Design developments can be introduced at this stage to alter the nature of the vehicle or adjust the relative dimensions. *X-CAD 3D* calculates the altered dimensions in perspective views as demonstrated in the diminishing wheel sizes. Probably the most difficult concept for any user to cope with is the X,Y,Z axis orientation. Drawing in 3D involves understanding the function of the 'Z' axis, which is the 'into the screen' axis. I found myself having to occasionally return to the 'right hand rule', ie thumb up, first finger pointing away, second finger pointing left. Thumb is the Y axis, first finger the X axis, second finger the Z axis.

OVER TO YOU IMAGINE

This really is the key part of the process described in this article. The image having been designed,

continued on page 147

EXTRA SUPPORT IN THE PUBLIC DOMAIN

There are 4 PD packages which use the Amiga's multi-tasking facility. These offer useful additions to the effectiveness of *X-CAD*. *Funkey*, on Fish disk 106, allows up to 50 *X-CAD* commands to be assigned to the Amiga function keys. *Calckey*, Fish disk 235, produces a pop-up calculator, available half way through entering an X-CAD command. Calculations can be made and the result 'pasted' back into the command window. *MSH* on Fish disk 327 enables MS-DOS disks with PC format files such as *DXF* to be read and entered into *X-CAD*. *PLT* is another handy utility which enables HPGL plot files to be printed via any of the Amiga preferences selected printer drivers at the highest possible resolution. *PLT* is on Fish disk 373.

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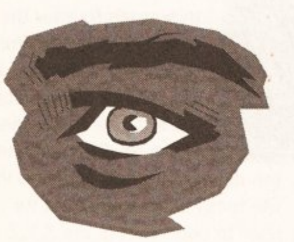
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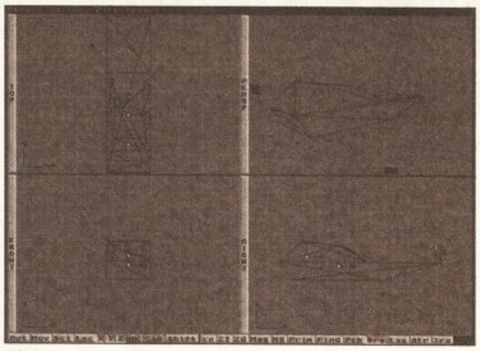
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Having ported the vehicle over to *Imagine 2*, I have removed some of the detail in order to reconstruct it using *Imagine*'s 'primitives' construction system

continued from page 145

modified and resolved is ported via a facility in the *X-CAD 3000* drawer utilities, known as Save Turbosilver. Exit *X-CAD 3D* and load *Imagine 2*.

Just as *X-CAD 3000* is a jewel, *Imagine 2* is solid gold star. The principal editors in *Imagine* are: detail, forms, cycle, stage, action, project and preferences.

Detail and forms are editors for object creation. Cycle is an editor for creating animation cycles. Stage is where all objects come together with lights and camera to create pictures and animation sequences. Action creates the scripts which affect the objects, cameras and lights, as well as the environment. Project is a special editor that sets the characteristics of the picture image size, and resolution, as well as rendering format. Preferences sets the interface environment you work in. The process of carrying out a task in *Imagine* is probably best understood by this schematic:

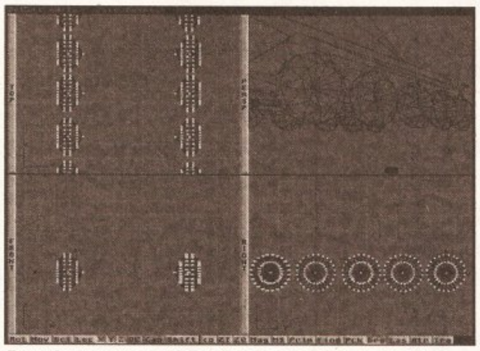
1 Enter detail editor ➔ Make object ➔ Save object

2 Move to stage editor ➔ Add lights ➔ Set globals

3 Move to project editor ➔ Set resolution ➔ Set render type

4 Render ➔ Show image

Whilst I could just go ahead and render the drawing imported from *X-CAD 3D* I want to demonstrate that *Imagine 2* is not just a tracing package, but also a very competent drawing utility. In the screenshot at the top left of this page, you can see that I have removed some of the stages in the drawing of the vehicle and taken the design back a few levels to repeat the construction in *Imagine*. Here is a description of how I went about creating the vehicle...



Development on the wheels clearly shows the system of constructing geometric shapes. Once built these are called 'objects' and can be duplicated and scaled at will

BODY OF THE VEHICLE

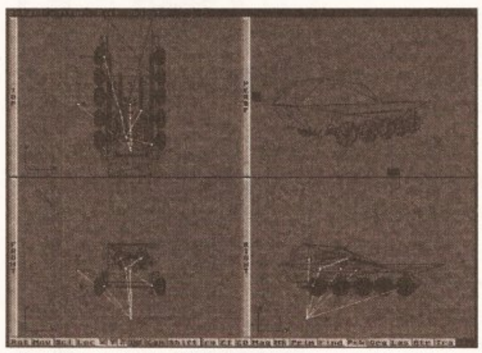
First of all I chose a primitive to base my buggy on. In this case, I chose a cube and stretched it to the body shape. I then added a canopy to the main body by shaping another cube to the original shape and removing some of the faces to allow viewing of the interior workings of the buggy. The screenshot below shows how I went on to recreate the wheels.

The wheels were created with a tube primitive, with 12 circular sections, 3 horizontal sections and closed ends. They were made into a tyre shape using the 'pick points' mode and given the attributes that you would expect of rubber.

The wheel that I created was then copied to all the other wheel positions along that side of the vehicle. To add the wheels to the other side, the wheels were rotated 90 degrees so that they faced in the other direction and then copied to all the positions along that side. A mud guard was made by selecting a plane primitive, with 3 horizontal sections and one vertical section. The plane was then bent into the required shape using the "select points" mode – essentially an easy process, but one that brings us back to the position we were in when I first ported the drawing from *X-CAD 3D*.

I want to present the completed design of my vehicle as more than just a technical drawing, so I move on to the ray-tracing or rendering facility. Options here are too numerous for me to go into, suffice to say that you can choose as many light sources or textures as you wish to make the completed article look as realistic as possible.

The illustration below shows the completed set of four views of my vehicle. I have to make a decision about which view of the vehicle I wish to render, how big I wish it to be, from what angle I wish it to be viewed and from which directions light sources should emanate. Finally, by collecting a series of renderings, possibly 25 to 50, I can combine the images to create an animation which could, for example, show my vehicle rotating, presenting aspects of the design specifications I wished to emphasise.



The final design which has been reconstructed using *Imagine 2*. Any of the on-screen windows can now be brought to full screen with the orientation altered until a suitable view is selected for rendering

CONCLUSIONS

The combination of two packages gives an outcome which is greater than the sum attributes of the respective programs. I do not often drool over software, but these two packages really deserve praise of the highest order. For anyone among you thinking about CAD or ray-tracing, these two are the business. Next month I'll be spending more time looking at the individual merits of each of these packages, showing you how to get the best from them.

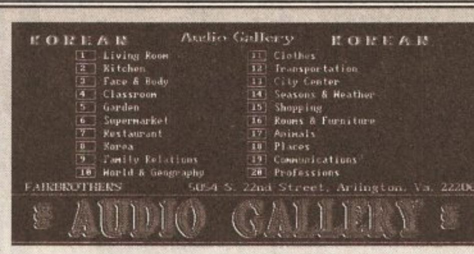
AUDIO GALLERY PICTURE DICTIONARY

Learning foreign languages involves three basic ingredients; pronunciation, grammar and words. *Audio Gallery* software promises to improve language learning across 10 different languages, but is it any good? I had a bash at the Korean package.

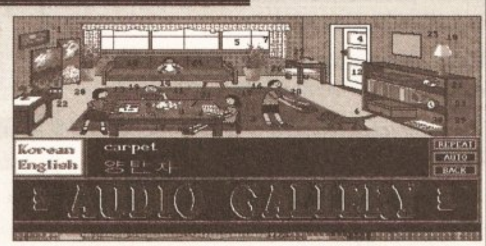
One characteristic of this series of packages is that they only teach words, not phrases, so anyone hoping to start as an absolute beginner would be unable to conduct the simplest of conversations in the selected language. There is however a paperback with each package which is divided into several sections, the first being phrases, such as "Does this bank have an accountant?" or "I have a kidney problem, and can't drink much."

There are 7 disks in the Korean package, a system disk and 6 language disks. The menu screen offers a choice of locations. Once this is loaded we are presented with a picture featuring around 25 numbered objects or persons. Clicking on the relevant number produces a sampled pronunciation. The quality is acceptable, and apparently spoken by a native of the respective language course's country. A pull down menu offers options of word rate, quiz, translation and quit. At the bottom of the screen, a window shows the translation in English and the written form in the native language.

Frankly I got bored quickly by the package. The computerisation adds nothing to learning the language instead of simply buying a paperback, other than a few pictures and digitised sounds. I was not impressed and suggest you would easily find more pleasurable ways to waste your money. ***Fairbrothers Software is available from Micro-PACE on 0753 551888. This range varies in price from £45 to £70 depending on the language.***



Left: The menu screen showing *Audio Gallery*'s choice of locations to learn or test your vocabulary. Try not to be daunted by the non-Roman alphabet to come...



Above: The living room with all the assorted paraphernalia that you might expect to find in any Korean household. Just point at a number and click – the speaker then bursts into life with digitised speech telling you the correct pronunciation for that word

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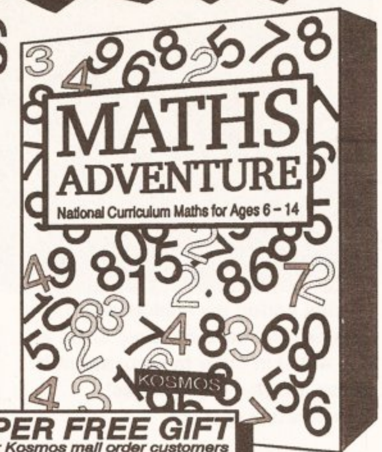
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Take it all on board

It's the turn of the beginners this month as Phil Harris demystifies modems and explores that nail-biting first call to a BBS board

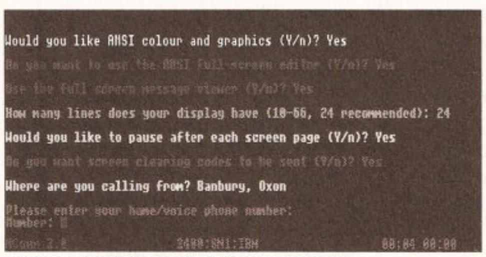
This month, by popular demand, I'm going to be taking a look at comms from a beginner's point of view, offering a step-by-step guide to logging on to a BBS for the first time. I'll also try to dispel a few myths. Let's start off by talking through that all important first call to a board.

The logon procedure for bulletin boards is very similar, no matter what board you are calling. It usually takes the form of two stages. Firstly you enter a few basic pieces of information, your name, where you are calling from and your date of birth. This information is usually stored by the BBS software itself, and is easily on hand for the sysop.

You then fill in a slightly more detailed questionnaire which is designed by the sysop. The questions in this vary depending on the board, but usually include things such as where you heard about the board and whether you would subscribe if it turns out to be good.

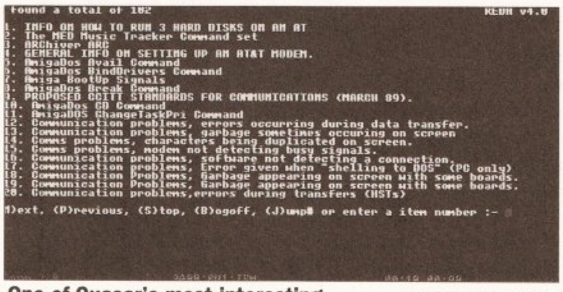
QUASAR

To give you an example of the sorts of questions you'll be asked, I'll take you through a complete BBS logon right up to the main menu. For this example I'll use Quasar, a PC-based board which has two short questionnaires for you to fill in. Other boards will be similar: only the questions will differ.



Quasar's system questions – these control aspects of how you want the board to look when you dial in

There are two ways of dialling the board. You can either enter the details into the dialling directory of the comms package you are using or you can dial in manually. Which you choose is entirely up to you, entering the number in the directory can be long winded, and a waste of time if you decide you don't like the board.



One of Quasar's most interesting aspects, an on-line database full of useful text files

I prefer to see what the board is like before cluttering up the dialling directory with numbers I don't want to call again, so I usually make the first call by hand.

To dial without using the dialling directory (using a Hayes compatible modem) you can talk direct to your modem. By typing:

```
ATDT08466930 67 <RETURN>
```

You will tell the modem to dial the number given and wait for a modem to answer. If what you type is not echoed back to the screen, check the modem is plugged in, turned on and the cable is connected.

SPEED DEMON

Also check that the speed at which the comms program is talking to the modem is correct. Set it at the highest speed the modem supports. If you have a modem which uses MNP5 or V42bis data compression, set it at *twice* the top speed. This is to ensure that the modem can transfer data between the modem and the computer fast enough to get a good download speed.

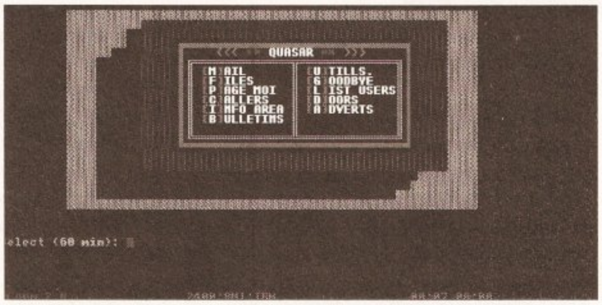
If the modem's speaker is on you may be able to hear the phone ringing, then the BBS will (hopefully) answer and your modem will squeal. This is the two modems 'chatting' to each other establishing the speed at which they should talk.

The same thing will happen if you dial using a dialling directory, except there will probably be a status window to tell you what's going on.

CONNECT 2400

Once the modems have finished establishing who and what they are, your end will return a message to tell you that it has connected and what speed you are operating at. The message you get should be the same no matter what modem you are using, and depends on the speed of the connection eg:

- CONNECT 300 Baud connection
- CONNECT 2400 2400 Baud connection
- CONNECT 2400/REL 5 2400 Baud connection, with an MNP 5 "reliable" link (ie data compression turned on).
- CONNECT 9600 9600 Baud connection



The Quasar main menu, make sure you've got a PC character set loaded if at all possible, otherwise the menu will look strange

The exact time it takes to get this message will depend on how fast the modem at the BBS answers the phone, and how complex the link is. For instance, if you are using a V32 (9600 baud) modem with MNP 5 (a data compression standard), it will

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Archive – To pack files into a compressed "archive" which can then be downloaded much faster than a normal uncompressed file.

BBS – An electronic bulletin board – what you call when you use your modem. It usually contains messages and archived files.

CIS – Compuserve, a large international US-based BBS. Very expensive.

CIX – Compulink Information eXchange. A popular UK on-line conferencing system. Mix with the rich and famous, but pay for the privilege.

Download – Transfer a file from the BBS, to your machine.

EMail – Electronic Mail. This is similar to normal "snail" mail, but the letters are electronic, and are transferred via modems.

Modem – A MODulator DEModulator. This connects to your machine and translates the digital signals from your computer into sounds which are then transferred down the telephone line to another modem.

MNP – A data compression and error correction protocol.

Off-line reader – A program which enables you to read messages from a conferencing system off-line such as CIX, saving you time and money.

Terminal – The comms package used to communicate with your modem. NComm or JRComm are the most popular.

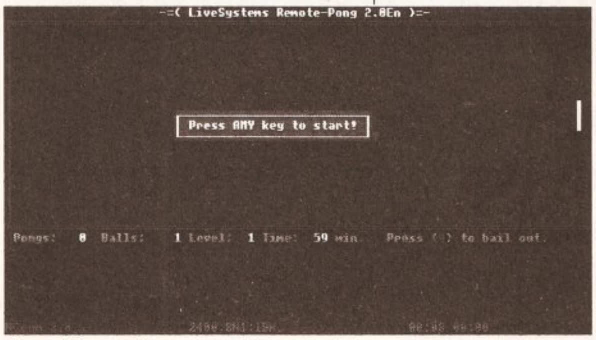
Transfer protocol – The method used to upload and download software. It ensures that no data is lost or corrupted during the transfer. Transfer protocols include XModem, YModem Kermit and ZModem.

Upload – To transfer a file from your machine to the BBS.

take several seconds for the modems to establish the connection. Much longer than a standard 2400 or 300 baud modem which only takes a second or two.

ON TO THE BOARD

Once the modems are talking to each other there will be a short delay



One of Quasar's many on-line arcade games – *Remote-Pong!*

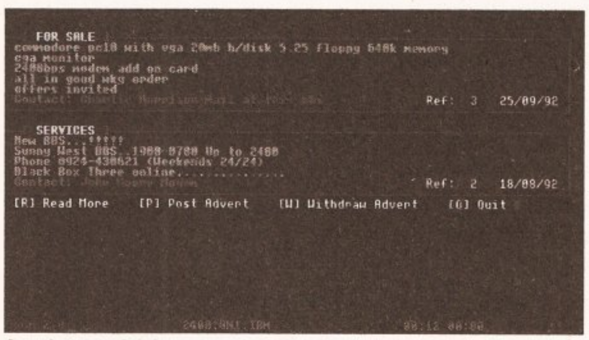
and then you will start receiving data from the BBS.

For Fidonet boards (a worldwide network of BBS enthusiasts), you will probably be greeted with a message from a mail handling 'front end'. These programs answer the phone and determine whether the call is from a human or an automatic electronic mail transfer. If it is the latter, the messages are received and placed in the board's database. If the call is from a user, the user is allowed on to the board.

To determine whether you are a human caller the front end will usually ask you to press the Escape key a couple of times. In the case of Quasar, this is the message you get:

```
CONNECT 2400/REL 5
**EMSI_REQA77E
FrontDoor 2.02; ↵
Noncommercial version
Press Escape twice for ↵
*-QUASAR-*
```

Once you press escape a couple of



Another useful Quasar area, advertisements for users to sell unused equipment or advertise their BBS

times you get a second message:

```
*-QUASAR-* is being loaded.
```

And you have to wait for a bit, while the BBS software is loading. This usually only takes a few seconds.

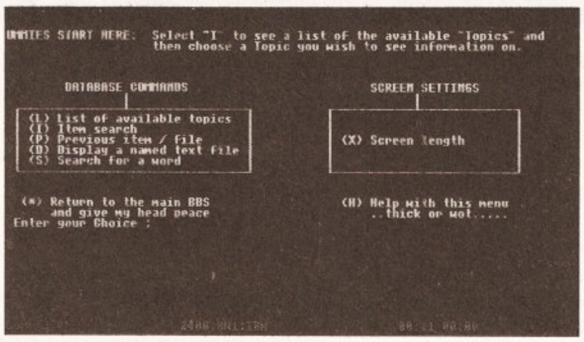
LOGON TIME

You then get a title screen with a bit of information about the board and then you'll be asked for your name. Once you've typed this in the BBS will check to see if you are already a member of the board.

If you are you will be asked for your password, if not, you'll be asked if you typed it correctly. If you did you'll be asked to go through the new user procedure. This name and password checking section is usually called 'logging on', 'logging in' or just the 'login'.

SETTING UP

The registration procedure for Quasar consists of two sections. The first gets standard information from you on how you want the board to look and which editors you wish to use.



The main menu for the Quasar Information centre, the board's on-line information database

An outline of the system's questions follows...

• *Would you like ANSI colour and graphics (Y/n)?*

ANSI colour and graphics makes the board menus more colourful and sometimes even allows a limited form of animation. The disadvantage is that there is a lot of information required to create the menus so everything runs more slowly. So, if you have a slower modem (2400 is about as slow as you can go and still use ANSI) answer 'no' to this.

• *Do you want to use the ANSI full-screen editor (Y/n)?*

If you do use ANSI colour, many boards now offer the facility to use a 'full screen' editor to enter messages. These editors are more friendly than the simple line based editors which are the alternative. They enable you to use the cursor to move around the screen and insert characters, in a similar manner to the Amiga's Ed program.

• *Use the full screen message viewer (Y/n)?*

Again, the full screen message viewer is a more friendly method of viewing a board's messages, whether you use it or not is up to you. It will be slightly slower but it is a lot more friendly.

• *How many lines does your display have? (10-66, 24 recommended)*

This is the number of lines that make up one page on your display. For a standard Amiga, 24 will be fine.

• *Would you like to pause after each screen page (Y/n)?*

If you answer yes to this, each time the number of lines specified above has been displayed, you will be prompted to see if you want to read more. This is to prevent information scrolling off the top of the screen before you get a chance to read it. All but the slowest modem users will answer yes to this; owners of slow modems will be able to read the text before it scrolls off the top of the screen anyway.

• *Do you want screen clearing codes to be sent (Y/n)?*

Answering yes to this question will cause your screen to clear after one of the prompts mentioned above.

If your comms software is slow at scrolling the screen, answer yes. Otherwise it's a matter of personal preference.

• *Where are you calling from?*

The general convention is to put your town, followed by a comma, then the county or, for overseas boards, the country. So mine would be "Banbury, Oxon" or "Banbury, UK" for an overseas board.

• *Please enter your home/voice phone number:*

It's important to fill this one in correctly – the sysop will probably check. Most boards also ask you to confirm the number.

Some boards also ask you for a data phone number, if you only have one telephone line, put the same number for both.

• *Enter your handle (RETURN for none):*

Your 'handle' is a codename which you can use when writing messages. There aren't many boards that allow you to have one, but Quasar does.

• *Please enter your date of birth (DD-MM-YY):*

The sysop will use this to verify that you are who you are if you lose your password.

PASSWORD TIME

The board will then ask you for a password. When selecting a password try not to not use one which is easy to guess. Use a different password for different systems. When you enter your password, check you've typed it correctly.

The system then checks for silly phone numbers or ones that have been banned from the system. Then we're on to a second questionnaire which has really been designed by the sysop to obtain a little 'market research' information to help him make the board more interesting...

Once you have filled this in, the system repeats the information and asks you to enter your password again. Then it's off to the main menu with access to the board.

Your access will be limited until the sysop gets a chance to verify your details which usually takes around 24 hours.

So that's about it as far as logging on goes. It is worth taking the time to answer any questions you are asked properly though, you'll avoid upsetting the sysop for a start – and you never know when you might need to ask him a question.

MAGIC OF MODEMS

There is nothing mystical about modems. Think of a modem as a special sort of telephone that transmits electronic noises rather than speech. They work via telephone lines and are subject to the same charges.

When a modem is being used on a phone line, no-one else can use the line, as is the case when someone else is making a phone call. There is no way of allowing two people to use the same phone line, so you can't use a modem at the same time as a normal phone.

If you're using a phone line as a BBS, calls will arrive in the same way as 'normal' phone calls – the phone will ring. If you pick up the phone you will get an earful of modem speak. There is no way of telling whether or not a call is from a modem or a voice call without answering the phone.

Philip Harris can be contacted as pharris on CIX (081 390 1255) or on End Zone BBS Fidonet (2:252/116) on 0524 752245.

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Amiga help club Contact John Kewley, Derlwyn, New St, Bethel, Nr C'von, Gwynedd, LL57 1YW. Meetings Mondays 7 – 10pm. Graphics, sound, Workbench, programming, help on any topic. Beginners welcome. Free membership

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Amiga User Group – FYLDE Contact Andy Wilkinson ☎ 0253 724607 25 Glen Eldon Rd, Lytham St Annes, Lancashire FY8 2AX. Meetings twice a month, newsdisk, tuition, technical support, Amiga advice Membership £15/year

Amiga Users club Contact Edward Metcalfe ☎ 021 7441430 49 Burman Rd, Shirley, Solihull, W Midlands B90 2BG PD swapping, games swapping (not copying), competitions, free membership

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Asia Amiga Association Newsletter, PD, information, advice, ideas, exchanges. Membership HK$250 per annum. For more info contact Pete Alex, Room 11c, Fortune Court, 4–6 Tak Hlng St, Kowloon, Hong Kong. ☎ 7245196

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Beaconsfield and district CC Contact Philip Lishman ☎ 0494 782298 27 Russell Court, Chesham, Bucks. Meetings at St Michaels Hall, St Michaels Green, Beaconsfield 7.45 – 9.45pm. Programming, gaming swapping PD, having fun. Membership £20/pa; £10/6 months

Bloomfield video and computing Contact Mrs Beryl Hughes ☎ 0267 2357522 Nashville, 50 Glynderi, Carmarthen, Dyfed SA31 2EX. Meetings at the Bloomfield Community Centre, 7.30pm alternate Tuesdays. Amiga for beginners, video techniques etc. Membership £5

BR & CJ Computer Club B Robinson at 23 Fairway Rd, Shepshed, Loughborough, Leicestershire, LE12 9DS ☎ 0392 72889 or 03922 841296. Regular disk mag packed with tips, reviews of games and serious software, game cheats database, demos and utils, very large PD library. Membership fee £1.25

Camberley User Group Lectures, competitions, advice, meetings, free membership. For more info contact F Wellbelove ☎ 0252 871 545

Champion PD Club PD at 30p, newsletters, advice, help and more. Membership £10. Contact Steve Pickett, 31 Somerset Close, Catterick, N Yorkshire, DL9 3HE

Chester-le-Street 16-Bit Computer Club Ground floor function suite, The Civic Centre, Newcastle Rd, Chester-le-Street. Meets Mondays from 7.30-9.30pm. Exchange advice and swap tips. ☎ Peter Mears 091 385 2939

CDTV Users Club Swap views on software and hardware. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES

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AS20

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GFA Basic Forum Contact J Findlay ☎ 0788 891197 or send SAE to 52 Church Rd, Braunston, Nr Daventry Northants NN11 7HQ. Free advice on programming in GFA. Also tutorial disk for sale. Beginners and advanced users welcome. Free membership

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Wigan ☎ B Caswell 0942 213402

JJC Amiga correspondence course £50/year. Contact PO Box 19, High Wycombe, Bucks HP11 1UF. ☎ 0494 983347

Kent Youth Computer Group Contact Jim Fanning ☎ 0233 629804 North Youth Centre, Essella Rd, Ashford, Kent. Meetings at the North Youth Centre, Thursdays 7 – 10pm computer fair visits, video and DTP work, monthly newsletter Membership 40p/month

Lothian Amiga Users Group Contact Andrew Mackie ☎ 0506 630509 52 Birniehill Ave, Bathgate, W Lothian EH48 2RR Advice and help in buying hardware, software etc, group buying, dealers' circulars welcome. Membership free

Maritime Amiga Club Maritime computing, interact with seafarers ashore on Amigas. Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447

Marksman (Trojan Phazer user group) Contact David Green, 67 Thicket Drive, Maltby, Rotherham, S Yorkshire S66 7LB Promotes use of the Trojan Phazer, swaps PD and own programs, aims to set up a disk magazine

N Ireland Amiga User Contact Stephen Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS. Disk based mag £2.50/issue. Free PD, SAE for further info

Norwich Masked Heros SAE for info. Free membership. Contact Zorro, 278 Aylsham Rd, Norwich, Norfolk NR32RG ☎ 0603 409899

Pennine Amiga Club 26 Spencer Street, Keighley, West Yorkshire BD21 2BU. Free membership, free advice and a newsletter. Contact Neville Armstrong for more info ☎ 0535 609263

Perth and district amateur computer society For further information contact Alastair MacPherson 137 Glasgow Rd, Perth. Meetings third Tuesday in every month, 8pm. General advice, talks, Amiga PD. Membership £6 or free for under 16s

Pete's PD PD from only £1 per disk. Send 50p for disk catalogue to Peter Garrett, chestnut Cottage, White Lion Road, Amersham, Bucks HP7 9JR

Public Domain Exchange Demos, music, utilities, animation. Annual fee £8 Contact D McLeish, 26 Taunton Ave, Leigh, Lancs WN7 5PT

Public Domain User Group Swaps PD, provides advice. SAE to 12 Oxford Rd, Guildford, Surrey

PUG Contact S Jackson ☎ 0446 772331 Whitebeam Cottage, Trerhyngyll, Cowbridge, S Glamorgan Cheap PD library, swap hints, reviews, articles etc. Send an SAE for further details

Redburn Computer User Group Contact Paul Armstrong ☎ 0294 56003, 12 Highfield St, Kilwinning, Ayrshire KA13 7BN. Meetings at the Redburn Community Centre, Dickson Drive, Irvine. Group meets every second Wednesday from 5 Aug 92, 6.45 – 9.30pm. Help, ideas, PD and shareware, graphics and business. Membership 75p per meeting; £7/year

Rye Computer Club Swap/meet at the Rye Community Centre. For info contact Oliver Campion, 71 The Mint, Rye, E Sussex TN31 7DP ☎ 0797 222876

Serious Amiga Users Membership £5, £1 admission. Contact J Kucak for more: ☎ 0706 290387. Fortnightly meetings 7.30-11 at the High Crompton Conservative Club

Shieldsoft PD at Wilmar Lodge, 13 Churton Rd, Rhyl, CLwyd.LL18 3NB. Write for more information. Basic programming help. Advice on the CLI and AMOS. Disks from only 50p to 80p. Membership free ☎ 0745 343044

Sherlock PD Quarterly disk mag, help and advice for beginners. 50p/disk. A Doyle, 44 Milton Street, Warrenpoint, Co Down, N Ireland

Shropshire Amiga Link Advice, monthly disk mag, PD £15/year fee. Contact N Cockayne, 2 Dodmoor Grange, Randlay, Telford, Shropshire TF3 2AW ☎ 0952 591376

Slim Agnus 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. Group meets the last Thursday of every month. PD library, BBS, advice from Amiga experts. Contact Philip Worrel.

Software City Swapping, competitions, club magazine. Membership £8. Contact N Richards, 9 HOllis Close, Manor Estate Farm, Rawmarsh, Rotherham, S Yorks S62 7LX or ☎ 0709 526092

Software Exchange Club Free help and advice. Contact Michael Lacey, Fern's Post Office, Enniscorthy, County Wexford, Republic of Ireland.

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. For more info ☎ Michael Pun 021-459 7576

South 16 Bimonthly mag and disk, also PD library. SAE for more info. £10/year. Contact Bruce, PO Box 16, Southampton SO9 7AU

Southport Amiga Users Advice, friendly evenings Mondays at 8pm. No charge, discounts from local store. For info contact Michael Mitcham, 5 Easdale Drive, Ainsdale, Southport, Mersyside. ☎ 004 79936

South Wales Club Newsletter, PD library, free newsletter, programs, help and advice. For more info contact D Allen 53 West Avenue, Trecenydd, Caerphilly, CF8 2SF

Steel PD, cheats, ideas, music, art, programming, hardware mods. Free membership. Contact James Whitehead, 33 Middle Cliffe, Drive Crowedge, Sheffield S30 5HB

Unique Styles Derek at 15 Montgomery Rd, Highbrooms, Tunbridge Wells, Kent on 0892 518319. By post only. For Amiga artists, programmers/musicians. Free membership

Wardray Hern Consortium User group of user groups for Amiga and possibly others. Membership fees to be discussed and incurred. PD library to be set up. Also Hern connection – worldwide contacts wanted. SAE and disk to WardCon info, (AS) Warren Hardy, 21 Stockfield Ave, Fenham, Newcastle upon Tyne NE5 2DX

Warpdrive (friends of Amiga) Amiga help-line, PD library, bi-monthly disk mag, free drinks, competitions and infosheet. £15 a year. Contact B Scales 110 Burton Ave, Balby, Doncaster DN4 8BB ☎ 0302 859715

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Wrexham District Computer Club PD, library, equipment loan. 10p to join, 50p to get in. Meetings at the Memorial Hall, Wrexham every Thursday, 7-10pm. Contact Paul Evans, 3 Ffordd Elfed, Rhosnesi, Wrexham, Clwyd LL12 7LU

Your Amiga Club Helplines, PD, social evenings, classes, club mag. Fee: £12, family £15. Contact P HIggins ☎ 0424 892269. The Old Chapel, Church Rd, Catsfield Battle, Sussex TN33 9DP

Zymurgy General Amiga computing. Free membership. For further info contact A Carr, 39 Sewlkirk Rd, Ipswich, Suffolk IP4 3JB. ☎ 0473 725241

Animal Kingdom

Jason 'Bellamy' Holborn goes in search of a rare but very useful breed of animal – the Real Things animation kits

Creating any form of animation is very difficult unless you've trained as a professional animator. Try to draw an animation of a real living creature though, and the process becomes even harder as you're no longer given the sort of flexibility and artistic license that cartoon animations provide. Even the pros are often hard pushed to create lifelike line drawings of living creatures, resulting in the increasing popularity of "Rotoscoping", a relatively new animation technique that draws upon the power of a computer linked to a video digitiser to literally 'film' the subject from real life actors.

Rotoscoping is fine if you just happen to own the necessary hardware and have access to either live subjects or the appropriate video footage, but even then the results can be rather hit-and-miss. Spotting a not-so-obvious gap in the market, Robin Bilson and his team of expert animators surprised the Amiga industry when he released *Horses,* the first in the series of *Real Things* animation packs, onto the Amiga market just over two years ago. Since then, the *Real Things* series have earnt themselves a very respectable following.

CLIP OFF THE OLD BLOCK

The *Real Things* series is a natural progession from the clip art files that have become so popular amongst DTP users. Instead of just a single static image, each 'real thing' is a *DPaint* Animation Brush which, when pasted down and looped, produces a very convincing illusion of movement. The applications for these anim brushes are tremendous, ranging from education and animation training, to advertising, multimedia, point-of-information systems and much more besides. Although the current range of *Real Things* kits are only the start, Living Data boss Robin Bilson believes that his animation kits are the start of something big.



Watch dogs: Even failed Barbara Woodhouses would find the dogs in RGB's latest *Real Things* offering easy to keep under control

With the continuing improvements in the quality of computer displays, there may eventually come a time when footage that would have previously have been filmed using traditional video tape will become completely digital. Take a common TV advertisement such as Andrex's toilet roll, starring that loveable puppy. With 24-bit colour and broadcast quality resolution, an ad such as this could be produced entirely on a computer using animated clip art such as the *Real Things* series. It could allow advertising agencies to reduce production costs substantially.

A NEW PACK

The latest in the *Real Things* series is *Dogs,* a two-disk collection of digitised animation brushes of our 4-legged canine friends. Like all the *Real Things* kits, *Real Things Dogs* is designed as a companion product for *Electronic Arts' Deluxe Paint 3* or *4,* both of which support the use of animation brushes, although they can also be used in any other package that supports the *AnimBrush* standard (Commodore's *AmigaVision* multimedia authoring system, for example). Coupled with *DPaint's* ease of use, the *Real Things Dogs* pack provides you with a massive selection of dogs of various breeds doing the sort of things that dogs do best.

Common household favourites and some rarer breeds are provided in side, front or rear views, running or walking. Making animations using these animated clip art files is easy using *DPaint's* powerful 'Move' option.

The *Real Things* series is not everyone's cup of tea. But animators, educators and multimedia directors alike will find them to be a real source of inspiration. AS

CHECKOUT Real Things Dogs

Ease of Use ●●●●○
If you know how to use *DPaint* then you already know how to use *Real Things.*

Image Quality ●●●●●
Now that Living Data have started digitising its subjects, the quality of each brush is very high indeed.

Documentation ●●●●○
Ignoring the rather lame 'in jokes', the manual is comprehensive enough for even the greenest of animators.

Price Value ●●●○○
Rather expensive for a collection of animation brushes unless you've got a genuine use for them.

Overall rating ●●●●○
The *Real Things* series just keeps on getting better.

THE REAL THINGS SERIES

HORSES

Released more than two years ago, this was the first in the *Real Things* series. Although it was greeted as something of an oddity, it quickly received the recognition it so deserved. Although the brushes themselves are hand-drawn in *DPaint,* both image and animation quality is very high. The pack includes a wide selection of animation brushes, covering a wide variety of different views and situations include horses both walking and running.

BIRDS

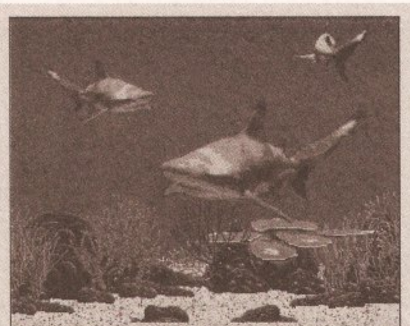
Our feathered friends got the *Real Things* treatment in the second instalment of the series. Once again, this pack too is hand-drawn, so image quality isn't quite on par with the more recent releases. The species on offer include herons, seagulls, doves, swans, birds of prey and other more common species.

HUMANS

Although a natural choice for the *Real Things* series, human beings didn't get the anim brush format treatment until the release of this third pack. The pack includes both male and female humans viewed from both the front and side, running, walking and generally being human-like. *Real Things Humans* is possibly the most useful of the entire series.

SAFARI

The Safari pack saw a radical improvement in the quality of the *Real Things images* with the introduction of actual digitised artwork. Although digitised images use more colours, the increase in quality is astounding. Create animations set in deepest Africa complete with Lions, Tigers, Giraffes, elephants and even monkeys. Visit Africa without the expense of travel!



Shark practice: Jaws strikes again in sea life, the fifth instalment in the *Real Things* series

SEA LIFE

Following on from the success of Safari, *Living Data* takes you below the waves in this fifth instalment in the *Real Things* series. Animate sharks, crabs (thankfully not the STD type!), turtles and tropical fish in your own digital gold fish bowl. Also included is a comprehensive set of background graphics which can be used to aid the drawing of backgrounds.

SHOPPING LIST

Real Things Dogs................ £29.95
by Living Data Ltd, RGB Studios,
Gables, Buxted,
East Sussex
TN22 4PP
☎ 0825 732666

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PERSONAL

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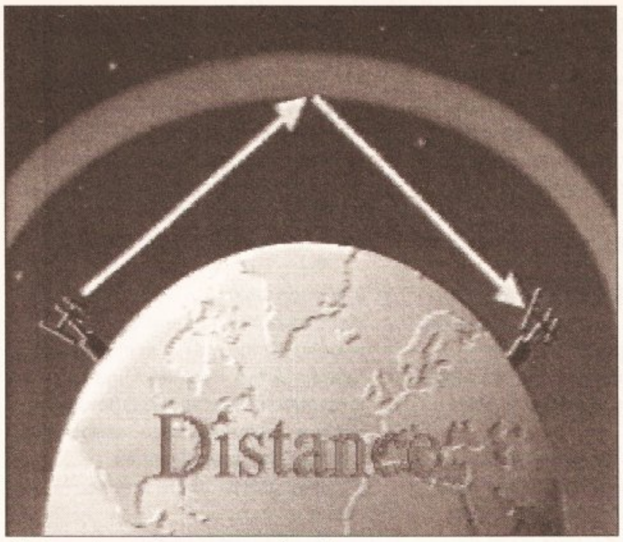
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SOFTWARE for FREE

Distance is another program for all you amateur radio fanatics out there. However, compared with the wider appeal of last month's *Morse Code Tutor*, it's a little disappointing

Ian Wrigley rounds up the pick of the PD crop with programs to test your maths, draw up a family tree, look to the stars and more. PLUS: A special look at the latest offerings in the Fred Fish collection

So, here we are again. Another month, another collection of public domain disks, giving the postman a minor hernia as he walks up the path. A large number of disk magazines continues to arrive, so next month I'll be doing a major round-up of new titles and the best of the old favourites. This month, Fred Fish disks 721 to 730 have just arrived, so I'll be taking a look at the best software from those. It looks like the frequency of Fish disks is slowing down slightly – 12 months ago, a new batch of ten seemed to appear every week or so. Is the end of Amiga PD in sight? I don't think so – indeed I think that, by and large, the quality is actually getting better and better. Perhaps what's happening is that people aren't releasing so much dross into the market nowadays, but are sitting tight on their projects until they are well polished and rather more bug-fixed.

Anyway, on with the show...

> "...the frequency of Fish disks is slowing down... Is the end of Amiga PD in sight? "

RATING THE PROGRAMS

Just to be awkward, I rate the software that I review in two different ways, depending on what it is. Disk magazines, collections of clip art and the like are given a 'value for money' rating, since you're essentially paying for one thing, or group of things, on the disk.

Single programs which appear in a collection of others, or programs which I've downloaded from bulletin boards, are given a 'program rating', which reflects how good I think they are, taking into account useability, bug-proofness, my own particular (or should that be peculiar?) tastes and so on. Both ratings are out of a maximum possible 10.

DISTANCE

Deja Vu disk L/102

First off we have another amateur radio program from Paul Higginson and Jason Dudgeon, the people who created the excellent *Morse Code Tutor* reviewed last month. This time it's a distance estimator: enter your home location, in latitude and longitude format, and then enter the QTHs (locations) of the people you're in contact with. If those cities are in the program's database, their longitude and latitude will be displayed, along with the distance (in miles) from you and the beam heading (the direction you should point your antenna to get the best reception). The program then prompts you for the next QTH.

Unfortunately, this program doesn't really have the same appeal as last month's Morse code tutor, for a number of reasons. First, the data file just isn't large enough – there are 194 locations entered, but they are from all over the world – and there are at least 194 cities and towns in Britain alone that should be included!

Of course, it would be impossible for the authors to include every major location in the world – but I'd have

BEGINNERS START HERE

What is PD?

PD is a general term which many people incorrectly use to refer to all freely-distributable software. In fact, PD (which stands for Public Domain) software is only one branch of this area; the other main one is shareware.

Essentially, PD software may be copied and used by anyone, although some authors place restrictions such as not allowing a PD library to charge more than a certain amount for the disk.

Shareware, on the other hand, should be treated more like commercial software. Although you are allowed to copy and pass around shareware programs, if you like one then you should pay the requested fee to the author – it's normally around £15 or less, and often entitles you to an upgraded version or a printed manual. Paying your shareware fees encourages software authors to write more programs – and if they don't, the Amiga scene will be a poorer place. Don't think that you're paying money for nothing, either – often hundreds or even thousands of hours of work have gone into creating a program, and it's only right that the programmer receives some reward for his or her work.

The third branch of software that we cover here is called licenseware. This is a form of shareware which is licensed to one (or more) PD libraries. In essence, when you buy a licenseware program you are buying shareware and paying the license fee at the same time. For this reason, you should treat any licenseware that you buy as you would treat commercial software – don't pass it around to your friends. You've only bought the right to use it yourself.

Can I pass other people copies of PD?

Yes – that's the way that it gets to a wide audience. Just make sure that you have followed the author's requirements for distribution – normally that you don't charge more than a certain amount for the disk, or that you make sure that all the documentation is included on the disk.

You can also pass on shareware – but not any registered copies of programs. If, when you pay your shareware fee, the author sends you an improved version of the program, then be careful not to give that out. Only pass on unregistered shareware.

You should not, of course, pass on licenseware – it should be treated in the same way as registered shareware.

preferred Nottingham to Tai Pei for starters.

To be fair, though, I should point out that there is an editor program supplied which allows you to enter details for other locations. Then there's the fact that both *Distance* and the file editor are written in AMOS. I'm not at all against AMOS – it's a great language, and a large number of pretty brilliant programs have been written in it. But it doesn't seem particularly suited to multi-tasking with other programs – and surely you're not only going to be using your Amiga to run *Distance*; I'd have thought that you'd also want to use a logging program or something similar. And neither *Distance* nor the editor has a quit function – you've got to re-boot the Amiga to leave the programs. And there are some other features that I'd want in the *Distance* program anyway. And...

All in all, I was rather disappointed in *Distance*. After the Morse tutor, I was hoping for great things. Back to the drawing board with this one...

Value for money...............5/10

A-GENE DEMO

Anglia PD disk U4020

This is a demo version of the full *A-Gene* program, a genealogy program written by Mike Simpson.

The limitations on the demo are that it only allows a database of up to 200 people and 70 marriages to be created – the full version, on the other hand, will store about 1500 people and 500 marriages on a floppy disk, more if you have a hard disk. Oh, and you can't work from a RAM disk in the demo version.

The *A-Gene* program was written in GFA Basic, and seems to work pretty well. The documentation is fairly clear, and a couple of minutes' browsing should provide you with enough information to start entering details.

The data entry screens are relatively straightforward, although I'm not particularly impressed with the requirement of entering dates as '01 Jan 1900': I automatically tried to enter a date as '01/01/1900', which managed to cancel the edit process – hitting '/' cancels editing at any time.

Another gripe is that you must assign each person – and each marriage – with a unique record number. However, the program doesn't automatically do that for you, so you need to keep track of which record numbers have been allocated and what the next blank one is – not the most intuitive of procedures.

There is space for a reasonable amount of 'standard' information – parents' names, birthdate, birthplace, date of death and so on – and the option to enter up to a screenful of additional data via a simple freeform text editor.

> **"A-Gene includes the facility to enter... the record numbers of up to three wives"**

You can also, if you wish, save digitised pictures of people, weddings and family groups – the documentation tells you what filename to save your IFF file under so that it will refer to the correct person/people.

When you've entered all this data, the program will collate and output it in a variety of different ways. You can, for instance, output a list of all parents with the names of their children; a list of family groups (mother, father and all kids; a 'pedigree chart', which is the standard tree diagram of a person's ancestors; and so on. All of this can be sent to screen, printer or, in the case of particularly voluminous listings, to a file.

If you're a member of the Church of the Latter Day Saints (Mormons to the rest of us), you'll be pleased to know that the program includes the facility to enter Ordinance information (whatever that is) and the record numbers of up to three wives.

The author is also currently writing a program to convert *A-Gene* files to the standard LDS Gedcom file format, so that they can be used on PCs running genealogy programs which support this format.

If you're interested in genealogy, and you can't be bothered filling in hundreds of little record cards and drawing vast charts on enormous sheets of paper, you will probably find *A-Gene* of great value. The fully-featured version is distributed by Amiganuts, but this demo should be good enough to be going on with.

Program rating.....................8/10



Above: *The Maths Adventure*: not as simple as it appears, this one may well frustrate adults, let alone children!



Right: Ha! I knew I was good! *Maths Reflex* tests the speed of your addition, multiplication and subtraction

CONSTELLATION DEMO

This is a demo disk of *Constellation*, a five-disk program containing images and information on a range of... yep, you've guessed it, star constellations.

The disk is the product of a group called Astronomy News Amiga, which is apparently a charity disk magazine whose profits go to the Milestone School for mentally handicapped kids.

The disk auto-boots, and starts with a title screen and Bach's Toccata and Fuge in D Minor (at least, an approximation thereof which to my mind owes rather more to Sky's version than it does to the original). This title screen is displayed for about a minute and a half – there's no way of speeding it up, which is a bit of a pain. Then the main options screen appears, from which you can read a couple of doc files or enter either the viewer program or another doc file which tells you that the astronomy quiz option you just selected is only available in the full working version of the program.

> **"Although Maths Reflex is intended for beginners, I found it quite compulsive"**

The only constellation supported in the viewer is Orion – although all the others' names are still present, so you're in for a fair bit of mouse work hitting the arrow button until Orion finally appears.

The screen is then divided into three areas (I'd show you a screenshot, but the program is written in AMOS and won't co-operate): a diagram, a 'zoom window' and an information window which gives things such as the brightness, distance away and so on of the constellation or individual stars within that constellation.

The zoom window comes into operation when you click on a star: it displays either a blob which represents the star in some way (don't ask me, I couldn't find any information on what the different colours are supposed to mean) or, in the more interesting cases, a digitised picture of the star or cluster.

To be honest, I wasn't particularly impressed with this program. It feels a bit clunky, stars are rather difficult to select (you have to be exactly in the middle of the star's image on the diagram, to within a pixel or so), and the documentation could have done with being run through a spelling checker – or at least being proof-read by someone else: I really hate it when people talk about a "computer programme".

As a charity disk mag, *Astronomy News Amiga* is at least a worthy idea. However, judging by the author's editorial style on the demo, many people might find it a bit of a trial to plough through.

Still, if you're interested, the five-disk version of *Constellation*, including data on 88 star constellations and an astronomy quiz, costs £6.50. The *Astronomy News Amiga* disk magazine is £1.75 per issue. Either (or both) are available from Astronomy News Amiga, 214 Northview, Swanley, Kent BR8 8BJ.

Program rating.....................5/10

MATHS REFLEX

Anglia PD disk C728

This disk contains two programs to test and improve kids' – and adults' – mathematical skills. Both were written by 18-year-old Australian programmer Jason Lowe (I know his age because, for some reason, he has the program display it when it loads). The program is basically a speed test, where you have to complete 40 fairly simple mathematical questions in as short a space of time as possible.

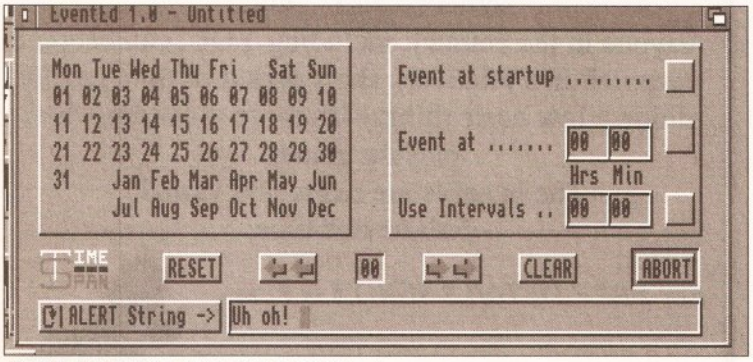
When you finish, the program

continued on page 158

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marks your answers and gives you a final percentage, based on your speed and number of correct results. Although it's really intended for 'learners', I found that it became quite compulsive – you know that you can do better than your previous score, if you only try it one more time...

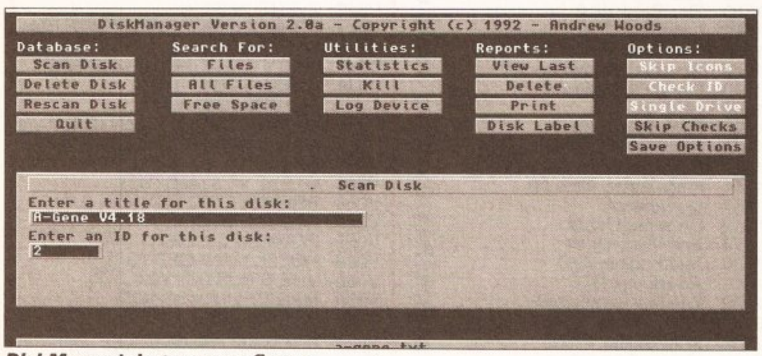
The other program on the disk is *The Maths Adventure*, which takes the form of a series of questions



The *Main Event* allows you to set up a list of events which will occur at a specific time. These can be programs running, or just alerts appearing on the screen

which you must answer to pass through ten rooms. Many of the questions are not particularly hard: "How many sides does a pentagon have?", "What is the difference between 99 and 1001?". However, some are rather more tricky, requiring some algebra and the ability to work out exactly what the question is from the text – which is interesting and amusing.

If you get a question wrong, you



***DiskMan* catalogues your floppy disk collection, then allows you to search for files, or for free space**

are sent back to the beginning – and the questions change, so you can't just remember the answers and repeat them.

Along the way, you are also given snippets of information: "Kim's watch is 15 minutes fast but she thinks it's 10 minutes slow", that sort of thing. At the end of the game you must use this information to solve a final puzzle.

The Maths Adventure is PD; *Maths Reflex Test* is shareware, with a £5 fee requested. I can thoroughly recommend this disk to anyone who wants a little mathematical challenge to while away an evening or so – I'm determined to get to the end of the *Adventure*, if it takes all day!

Value for money..................10/10

THE MAIN EVENT

Software Expressions disk U149

The Main Event is an event editor – essentially a timer system which allows you to specify actions which will occur at given dates and times.

> **"The Converter will convert from and to any units that you can think of"**

These actions can include messages being flashed up on the screen, a specific program running or whatever.

The program supports five different types of event: a CLI command, a message posted in a Workbench window, a display of the date and time, screens flashing and an alert – specified text appearing in one of those "Oh no, my Amiga's crashed"-style orange boxes.

The program's uses range from posting reminder messages to running hard disk back-up programs at night when the machine isn't in use.

The package actually comes in the form of two separate programs: MainEvent, the actual event processor, and EventEd which allows you to create and edit events. MainEvent can either be run from the CLI or Workbench, or entered as a command in your startup-sequence – which means that it will automatically run. In fact, Workbench 2 owners can just drop the event file into the WB_Startup drawer and this will kick the program off automatically.

The event editor is easy to use, consisting of requesters for the time and date of each event, and a looping list of possible event types (CLI command, alert text or whatever). When you've created your list of events, you just save the whole 'project'.

The Main Event is shareware: a £5 registration fee gets you the full version. The trial version allows up to 20 events in any project, and files are valid for a month from their creation date. The full version allows up to 50 events in any project – and files are, of course, valid forever.

You probably already know whether you would find a use for *The Main Event*: if you've been thinking, "By God, that's exactly what I want" then you should get hold of it now.

If you haven't the slightest idea why on Earth you would want to run programs at specific times, keep that fiver safely tucked in your pocket.

Program rating....................8/10

DELUTILS 1

NBS disk U727

The main program on this disk is *The Converter*, by Derek Piper. This is a shareware (£2 fee requested) program which will convert from and to virtually any units you can think of. Pounds to gallons? Fahrenheit to Kelvin? Metres to yards? Wavelength to frequency? No problem.

And for many of the conversions, there's the option to print out a conversion table, too.

Also included on the disk are *ScreenInfo*, an AMOS utility for getting information on screens, and *PolyColour*, a "proglette" which displays a 'bouncing rubber band' effect.

Basically, if you buy this disk it'll be for *The Converter* – and if you've a need for a conversion program, it might as well be this one.

The program actually multi-tasks – F6 takes you to the Workbench, F10 flips back to the program – and contains just about any conversion you might need. The other programs will probably soon be consigned to the bin.

Program rating....................7/10

DISKMANAGER 2

By Andrew Woods

DiskManager is a disk cataloguing program which allows you to build up a database of the contents of your floppy disk collection. It will then search that database according to criteria you specify.

A good deal of thought has obviously gone into this program, and the result is something which is easy to use and which will probably be found useful by anyone with a large collection of floppies. For instance, moving the cursor over any button produces a line of text at the bottom of the screen describing its action. Scanning disks is as simple as inserting a disk, hitting the Scan Disk button, entering a name and ID number (the disk's name appears as a default, as does a sequential ID number) and waiting for a few seconds.

Once your disk collection has been catalogued, you can search for a specific file or, if you wish, for a disk which has a certain amount of free space. You can even specify a filename and a size – so looking for, say, all '.doc' files over 300K is easy. Finally, the program will print a disk label containing the names of up to seven different files on the disk.

DiskManager is shareware: the author, Andrew Woods, requests a £10 fee.

> **"DiskManager will be found useful by anyone with a large collection of floppies"**

To encourage you to register, a requester appears periodically, reminding you that you're using an unregistered copy – a conscience-pricking idea which appears to be becoming more and more popular in the shareware field.

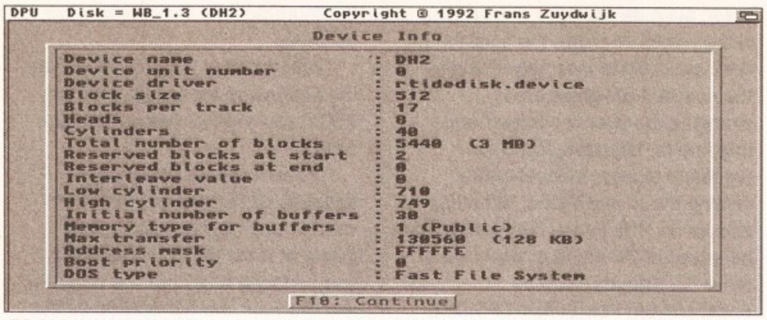
If you've a large library of disks, I can thoroughly recommend *DiskManager*. It should start appearing soon in the catalogues of a number of PD houses, including Battleaxe PD; but if you want to register immediately, send your £10 to Andrew at 1 Westwood Gardens, Scarborough, North Yorkshire YO11 2JQ.

Since Andrew is also one of the creators of the *TDH* disk magazine, anyone who mentions that fact when sending in their shareware fee will get a free copy of *TDH*.

You can't say fairer than that.

Program rating....................9/10

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***Disk Peek and Update* allows the inquisitive to find out about – and change the contents of – any disk drive attached to the Amiga. Make sure you're supervised by an adult, though!**

FISH DISKS

Anglia PD has sent me the latest batch of disks to come from the Fred Fish collection – disks 721 to 730 – so here is the pick of the contents. They can all be obtained from Anglia.

DPU (DISK PEEK AND UPDATE)

Fish disk 721

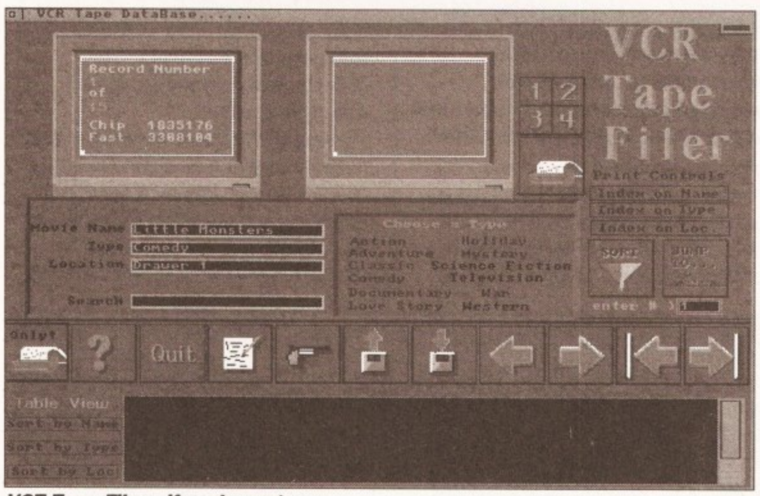
This is a hex disk and file editor which allows you to access, at a low level, all the data on any disk attached to the Amiga, whether it's a floppy disk, a hard disk or even a CD-ROM. You can also display various parameters associated with the device.

This is the kind of program which enables you to wreak havoc with your disks – so only use it if you know exactly what you're doing! However, for the more propellor-headed out there, it does its job well, and provides you with as much control over the disks as you could want.

> *"DPU is the kind of program which enables you to wreak havoc with your disks..."*

DPU is totally keyboard-driven, with function keys selecting the various options, so you can keep your fingers hovering over the keys, ready to totally corrupt that vital boot block! Seriously, I'd love to know if there's anyone who actually needs this kind of program. I'm sure that the author had a reason for writing it, but I doubt that more than about 1 per cent of the Amiga-using public will actually find a use for it. Still...

Program rating....................8/10



***VCT Tape Filer* – if you've got so many tapes that you need a database of them, this one will do the job nicely**

VCR TAPE FILER

Fish Disk 721

This is yet another flat-form database, tailored to a specific purpose – in this case, cataloguing your videotapes. It only works in interlaced mode, which means that unless you've got good eyesight and a decent monitor you'll find it pretty unusable, but given that limitation it performs pretty well.

You'll have to be prepared to do some experimenting with *VCR Tape Filer* though, because the documentation is somewhat sparse. "This program is very easy to use and therefore shouldn't need a very long doc file," says the author, Ken Winfield. Well, Ken...

You enter details of your tapes' names, subject type, location and so on, and you can then search using any of these categories.

The usual printing functions are available, as are some mysterious numbered buttons which seem to do almost random things such as quitting the program with no warning. Still, if you really have so many videotapes that you need a computer program to keep track of them all, this one will do nicely.

Program rating....................7/10

ANIMAN

Fish disk 723

I couldn't test this program out, since it requires either a *Perfect Sound 3* or *Sound Master* digitiser, but I felt that I just had to list it. According to the documentation, *AniMan* provides you with "an animated talking head that will run any Amiga program by voice command.

"Ask for an Amiga program by name, and *AniMan* will oblige. If *AniMan* becomes impatient, you may be insulted. *Animan* will also recite poetry if you ask nicely."

This sounds like the naffest, most appaling program ever – and I'm fascinated. If anyone has actually used it, do write in and let me know what it's like!

DISKMATE 2.1

Fish disk 723

DiskMate is a multi-tasking, multi-drive disk copying program by Malcolm Harvey. It should work with DOS and non-DOS disks, and incorporates facilities to format and erase disks.

The program allows you to copy a disk image to the RAM disk, so people with only one floppy disk drive (but enough RAM) can avoid all the annoying disk swapping that many other copiers require.

> *"AniMan will run any Amiga program by voice command"*

The documentation is a bit sparse, so you should be prepared to experiment a little, but most of the functions are quite obvious.

The fact that it seems to work fine in the background is a major plus-point with me – it means that I can get on with other things while the Amiga grinds away duplicating important data.

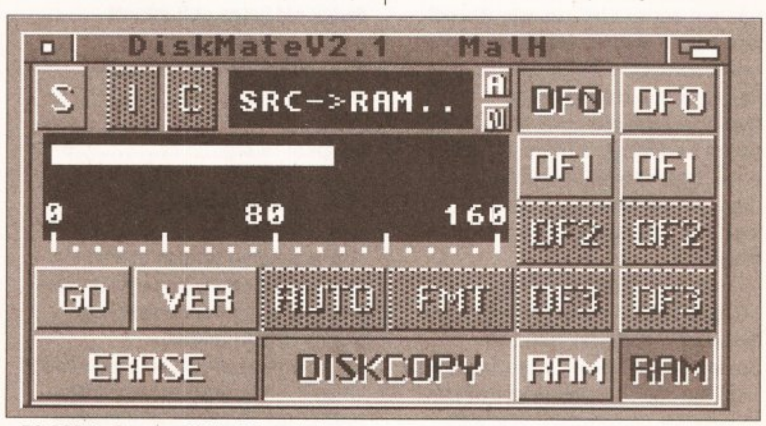
DiskMate 2.1 is a simple little program, with few frills, but it does its job quietly and efficiently. For that reason, I give it...

Program rating....................9/10

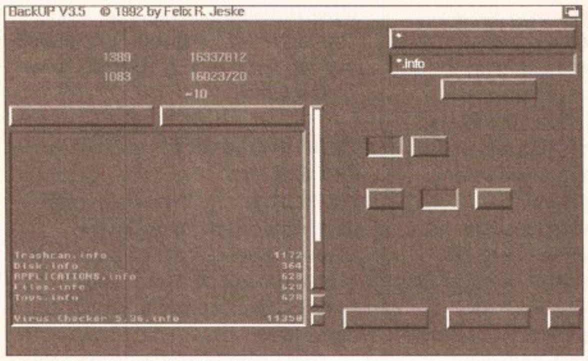
BACKUP

Fish disk 724

BackUP is a shareware program from Felix Jeske, which will create full or incremental back-ups of your hard drive. Basically, a full back-up puts all of your files on floppy, whereas an incremental back-up will only save those files which have been changed or added since the last back-up. Incremental back-ups are useful



***DiskMate* is a multi-tasking disk copier – and that's all. It works well, though**



BackUP **will create full or incremental back-ups of your hard drive: if you use a hard drive, get hold of a copy!**

where the majority of the data doesn't change – and because they take far less time to make than full back-ups, many people who can't be bothered to go the whole hog can be persuaded just to stick a couple of floppies into the disk drive and put up with a couple of minutes extra at the end of the day.

The program makes use of the '.lh library', to implement .LZH file compression – so that you save on the number of floppies needed. Although the documentation supplied says that this library is not included, good ol' Fred Fish has come to the rescue and supplied scripts which install both that and the special font required.

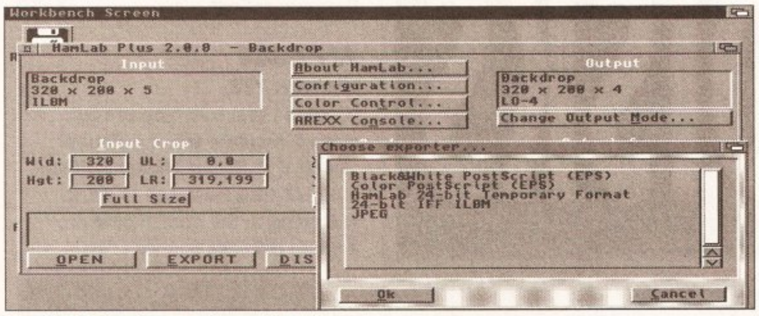
> ***"Any hard disk user who's experienced a system crash will tell you about that experience..."***

Be sure to install both of these – without them, the program refuses to run, but doesn't tell you why it's not working. Of course, file compression has a downside: it can take far longer for the back-up to be performed. On the other hand, when you're backing up a 50 or 100Mb drive, time may be less important than the fact that you'd need well over half a hundred floppies to do the job.

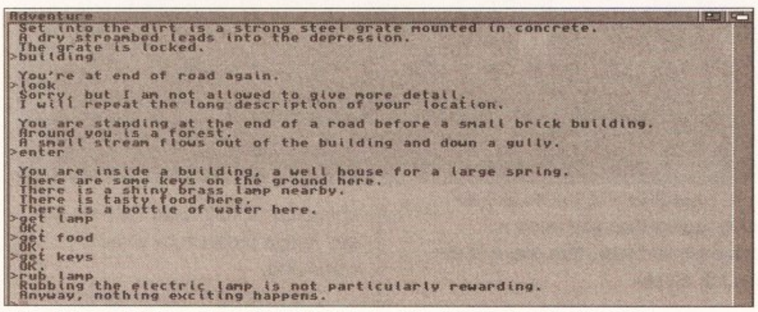
The user interface is very neat, using blue and red text to inform you just what's going on. You can automatically exclude, say, .info files from the back-up, and select whether to have file compression and data verification turned on or not. You select whether or not to include files in the back-up by simply clicking on them in a scrolling window.

Any hard disk user who's experienced a system crash will tell you just how dreadful that experience is – and you can guarantee that, if it happens to you and you didn't bother making a back-up, the first thing anyone will say is, "Oh, you should have backed your data up. I do."

Rather than getting into this situation – where your next step is usually to pick up a big stick and beat your ex-friend around the head – you really should back up at least your important data files. It only takes a few minutes, a stock of floppies, and a program such as this – which can be thoroughly recommended.



HamLab Plus **is an extremely powerful image manipulation program, with a wealth of import and export filters. Highly recommended!**



The ***Colossal Caves*** **adventure finally makes it to the Amiga – with all the dodgy old jokes still intact!**

Program rating....................9/10

HAMLABDEMO

Fish disk 726

This is a demo version of *HamLab Plus*, an extremely powerful image processing/conversion package written by Ed Hanway.

This program allows the import of images in formats such as HAM, HAM-E, GIF (Graphics Interchange Format), TIFF (Tagged Image File Format), JPEG (Joint Photographic Experts Group), Sun Rasterfiles and a number of others.

Once imported, the image can be cropped or altered in a number of ways, such as changing the gamma value (which changes the contrast of dark areas while inversely changing the contrast of lighter areas), changing the overall contrast and brightness, adjusting the colour response curves, independently scaling the X- and Y-axis, dithering and so on. The image can then either be saved in IFF mode or exported in other file formats such as Encapsulated PostScript (EPS) and JPEG.

The program's user interface, while necessarily containing a large number of options, is soon understood, and most basic functions can be performed without reference to the copious documentation. There's even an ARexx port built in.

One of the great beauties of the program is that it is expandable: it uses separate 'filters' to cope with importing and exporting the different file formats, so new filters can be (and are being) written, which add to the program's functionality.

This idea of 'plug-in modules' is used in image manipulation programs on other platforms – such as *Photoshop* on the Mac – with great success. It means that anyone with the know-how and the specifications can write filters – and the more filters that are available, the more popular the program will become.

And the best thing of all is that the shareware fee is just $25 (or $20 if you register before January 1993).

To ensure that people do register, Ed has limited the demo version to images of 512 x 512 pixels or less. While this is plenty good enough to try out the program, you will want the full version before long. And remember, you may well get other filters when you register your copy of the program – I'd guess that graphics professionals will have a vested interest in making sure that this program does well.

This program shows just how good Amiga programs can be; in some respects it rivals programs like *Photoshop*, which only runs on the Mac and costs £800 or so.

I really do urge anyone who works with images on the Amiga to check it out. And register!

Program rating..................10/10

ADVENTURE

Fish disk 727

OK, OK, I know that we don't cover games in *Amiga Shopper*, but I couldn't resist this. It's the *Colossal Caves* adventure, the grand-daddy of them all which was written on a mainframe by Donald Woods and Will Crowther.

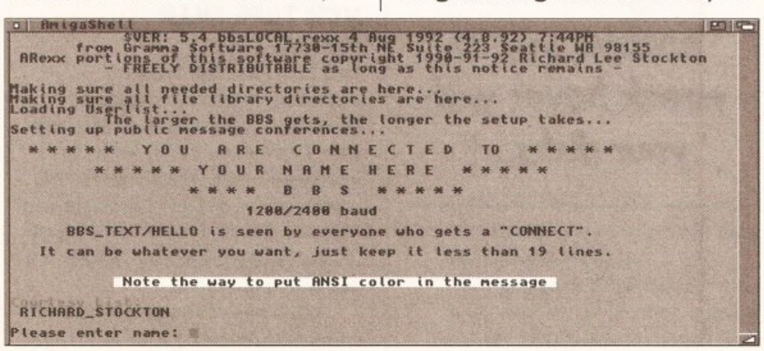
Totally text-based, with a limited expression parser, this game should be made compulsory for anyone who wants to see how adventure gaming really started.

The Amiga version, converted by Tony L Belding, looks to be pretty damned close to the original. There are some slight differences: short descriptions are not quite as tidy, so you are told things like "You are at end of stream", but these are just semantic quibbles.

If you pine for the good old days when you were lucky if you could get 10 minutes on the printer-only terminal of an old IBM mainframe, then...

a) You're a sad old bugger, and
b) You should get hold of this.

Program rating.....................8/10



If you ever wanted to run your own bulletin board, ***BBBBS*** **might be the answer to your dreams**

BBBBS

Fish disk 729

BBBBS is the Baud Bandit Bulletin Board System, and was written by Richard Lee Stockton. It requires the commercial *BaudBandit* program, which (apparently) sells for around $50, and also ARexx – which, of course, is built in to Workbench 2.xx.

Once you have these things, you can easily set up your bulletin board; the instructions provided with *BBBBS* are fairly clear, and shouldn't cause you many problems if you've used bulletin boards yourself. Essentially, the set-up procedure involves editing system files so that things like logon messages and the like are relevant to you – then connect up your modem and wait for your first call!

A neat feature is the ARexx interface to the system, which means that you as sysop can access the board at the same time as a user who's dialled up. This way you can perform housekeeping tasks without taking your board off-line – and nothing frustrates prospective callers more than not being able to access a board for long periods of time.

Although the system has a features list as long as your arm, some of the important features are:

- Up to 99 file libraries
- Up to 99 threaded message conferences
- Unlimited number of users
- Unlimited number of files and messages
- Sysop-controlled access to files
- Interface to external devices such as CD-ROM
- E-mail can include binary mail

If you think that starting a BBS might be a good idea – and if you can get hold of the *BaudBandit* software which is required for this system – *BBBBS* might be just the job. What's even better, as long as you're not going to use the program commercially, it's free.

Program rating....................8/10

WHERE TO GET IT

There are two main ways to get hold of Amiga PD and shareware: from a bulletin board or from a PD library.

The advantage of using a bulletin board is that often the latest software is uploaded as soon as it's available. On the down side, you need a modem to connect, and you'll have to pay phone charges (and sometimes a connection fee to the bulletin board as well).

There are a growing number of bulletin boards with a wide range of Amiga software available for download. Check out 01-for Amiga (071 377 1358) and the Cheam Amiga Bulletin Board (081 644 8714). Another good option is joining CIX (the Compulink Information eXchange), which not only has Amiga software but also contains conference and file areas on a wide range of subjects, from politics to scuba diving, biking to Science Fiction. Many of the *Amiga Shopper* writers have accounts on CIX, so you can get first-hand advice on your problems, too. For more details, call CIX on 081 390 8446 (voice) or 081 390 1255 (modem).

If you don't want to use a bulletin board, the other way to get PD software is from a PD house. Many advertise in *Amiga Shopper*, and you'll find a comprehensive list of names and addresses at the end of this article. Expect to pay between 99p and about £2.50 per disk – there's often a discount if you buy in bulk, too. As for the difference between the companies which charge 99p and those which charge £2.50 – well, try both types. There are brilliant, totally professional PD houses which charge less than a quid, and there are totally incompetent (dis)organisations which charge more than twice that. On the other hand...

UK PD HOUSES

3 Amigos
16 Marsett Way
Leeds LS14 2DN
☎ 0532 733043

Amiganuts United
169 Dale Valley Road
Hollybrook, Southampton

AMOS PD
1 Penmynydd Road
Penlan, Swansea SA5 7EH

Anglia PDL
115 Ranelagh
Felixtowe, Suffolk IP11 7HU
☎ 0394 283494

Blitterchips
Cliffe House, Primrose Street
Keighley BD21 4NN
☎ 0535 667469

CLS
PO Box 7
Bletchley
Milton Keynes, MK2 3YL
☎ 0908 640763

Crazy Joe's
145 Effingham Street
Rotherham
South Yorks S65 1BL
☎ 0709 829286

Deltrax PD
36 Bodelwyddan Ave, Old Colwyn
Clwyd LL29 9NP
☎ 0492 515981

Deja Vu
7 Hollinbrook, Beech Hill
Wigan WN6 7SG
☎ 0942 495261

Digitz
PO Box 144, Mexborough
South Yorks S64 9SL
☎ 0709 571748

EdLib
7 Sampford Brett Lane
Williton
Somerset TA4 4JT
☎ 0984 32320

EMPDL
54 Watnall Road
Hucknall
Nottingham NG15 7LE
☎ 0602 630071

Essex Computer Systems
118 Middle Crockerford
Basildon
Essex SS16 4JA
☎ 0268 553963

George Thompson Services
Cucumber Hall Farm,
Cucumber Lane
Essendon
Herts AL9 6JB
☎ 0707 664 654

Goldstar Computers
PO Box 2
Tyldesley
Manchester M29 7BN
☎ 0942 895320

ICPUG
PO BOX 1309
London N3 2UT
☎ 081-346 0050

Kernow Software PD Library
51 Ennors Road
Newquay, Cornwall

NBS
1 Chain Lane, Newport
Isle Of Wight PO30 5QA
☎ 0983 529594

Neural Images
4 Flint Walk, Hartlepool
Cleveland TS26 0TE
☎ 0429 263508

Office Choice (OC-PD)
30 Town St, Kirkintilloch
Glasgow G66 1NL
☎ 0236 737901

PD Soft
1 Bryant Ave, Southend-On-Sea
Essex SS1 2YD
☎ 0702 466933

Pentire PD
10a Hag Hill Lane, Taplow
Maidenhead, Berks SL6 0JH
☎ 0628 666641

Public Dominator
PO BOX 801, Bishop's Stortford
Herts CM23 3TZ
☎ 0279 757692

Riverdene PDL
30a School Road
Tilehurst, Reading
Berkshire RG3 5AN
☎ 0734 452416

Telescan Computer Services
Handsworth Road
Blackpool FY5 1SB
☎ 0253 22296

Sector 16
160 Hollow Way, Cowley, Oxford
☎ 0865 774472

Seventeen Bit Software
PO BOX 97, Wakefield
West Yorks WF1 1XX
☎ 0924 366982

Software Expressions
Unit 4, 44 Beauley Road
Southville
Bristol BS3 1PY
☎ 0272 637634

Softville
Unit 5, Stratfield Park
Elettra Avenue,
Waterlooville
Hants
PO7 7XN
☎ 0705 266509

Start Computer Systems
20 Holmside
Sunderland
Tyne and Wear SR1 3JE
☎ 091 565 2506

Startronics
4 Arnold Drive, Droylsden
Manchester M35 6RE
☎ 061 370 9115

Unique Computing
114 Salters Road, Gosforth
Newcastle on Tyne, NE3 3UP
☎ 091-284 7976

Vally PD
PO BOX 15, Peterlee
Co Durham SR8 1NZ
☎ 091-587 1195

Wirral PD
PO Box 4, Birkenhead
Merseyside L41 4FW
☎ 051 651 0646

BUYING ADVICE FOR SHOPPERS

Whether buying over the phone or at a local store, here's our advice on how to get what you want

BUYING IN PERSON

- Where possible, always test any software and hardware in the shop before taking it home, to make sure that it works properly.
- Make sure you have all the necessary leads, manuals or other accessories you need.
- Don't forget to keep your receipt.

BUYING BY PHONE

- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
- Check the price you are asked to pay, and make sure that it's the same as the price advertised.
- Check that what you are ordering is actually in stock.
- Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
- Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you buy by, you are entitled to return a product if it fails to meet any one of the following three criteria:

- The goods must be of 'merchantable quality'.
- The goods must be 'as described'.
- The goods must be fit for the purpose for which they were sold.

If they fail to satisfy any or all of the criteria, then you are then entitled to:

- Return them for a refund.
- Receive compensation for part of the value.
- Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check the hardware or software as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim the money from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

A CHECK LIST FOR MAIL ORDER BUYING

1 **Make sure you know exactly what you want. Draw up a checklist of the specifications you are looking for and what you want it to be able to do. Check with the suppliers that their product matches your list**

2 **Will the product you have in mind work with your existing set-up, and anything else you are planning to buy?**

3 **Can you see a demonstration? Many products are on display at computer shows around the country.**

4 **Are there any hidden extras? Does it need 1Mb to run, or a hard disk?**

5 **What technical support is provided by the supplier? Does the manufacturer offer after-sales advice? Check before you buy.**

6 **Check the guarantee terms. How long is the free warranty? What does it offer?**

7 **Draw up a list of these details and make them a condition of your order.**

8 **Check the price and delivery details when you order, and make a note of them.**

9 **Note down when you placed the order and who you spoke to.**

10 **When it arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier. If it doesn't work, make the obvious checks such as the fuse. If it still doesn't work don't try to fix it – contact the supplier.**

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The HD8+ hard drive offers up to 8Mb of standard internal Fast RAM expansion and the A530 Combo, up to 8Mb of 32-bit wide fast RAM expansion. Both feature a SCSI controller, which supports up to 6 additional devices, and an Autoboot/Game cut-off switch. Both are available in 80, 120 and 213Mb hard drive versions.

In addition, the A530 Combo zooms the Amiga forward with an 030 accelerator, running at a blistering 40MHz. This enables your Amiga 500 to run at an incredible 12.1 MIPS, faster than an Amiga 3000! No other product in the world combines all the features found in the A530 Combo! A plug-in PC emulator option, shown below, is available for the HD8+ and A530 Combo.

NEW! NOW IN STOCK
80Mb HARD DRIVE
ONLY £399



A530



HD8+

AMIGA GOLD FORMAT

	HD8+	A530
HARD DRIVE		
SCSI HARD DRIVE 40, 80, 120 & 213Mb VERSIONS	●	●
ULTRA FAST ACCESS	●	●
TRANSFER RATE UP TO 2,100K/sec* (*THE RATE OF THE 213Mb HD)	●	●
ACCELERATOR		
40MHz 68030EC CPU		●
OPTIONAL 68882 MATHS CO-PROCESSOR		●
RUNS AT 12.1 MIPS (FASTER THAN AN A3000!)		●
HARDWARE SUPPORT TO MAP KICKSTART INTO 32-bit WIDE FAST RAM FOR FASTER OPERATION (LIKE CACHING THE OPERATING SYSTEM)		●
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UP TO 8MB OF 8 OR 9-bit FAST RAM (8 OR 9-bit WIDE SIMMS - 120ns OR QUICKER)	●	
UP TO 8Mb OF 32-bit WIDE FAST RAM (32-bit WIDE SIMMs - 60ns)		●
1Mb POPULATED		●
OTHER FEATURES		
HDD/ACCELERATOR 'CUT-OFF' SWITCH FOR 100% GAME COMPATIBILITY	●	●
SCSI CONTROLLER FOR UP TO 6 ADDITIONAL DEVICES	●	●
VLSI CUSTOM CHIP	●	●
FAAAST ROM SCSI DRIVER	●	●
IDENTICAL COLOUR & STYLING TO THE A500	●	●
BUILT-IN VENTILATION FAN TO PREVENT THE UNIT FROM OVERHEATING	●	●
DEDICATED POWER SUPPLY	●	●
'MINI-SLOT' FOR FUTURE EXPANSIONS (E.G. PC EMULATOR)	●	●
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DIRECT MEMORY ACCESS (DMA) STYLE FOR ULTIMATE PERFORMANCE	●	●
EASY-TO-USE SOFTWARE	●	●
2 YEAR WARRANTY	●	●

PC EMULATOR
PLUG-IN OPTION FOR HD8+ & A530



- 16MHz 80286 processor
- 287 Maths Co-Processor socket
- 512K of PC RAM plus the use of Amiga RAM
- Supports Hercules, CGA, EGA/VGA (monochrome) and T3100 video modes
- Runs MS-DOS (3.2 and upwards) plus thousands of other PC programs

This powerful 286 emulator module simply plugs into the "mini-slot" of the GVP HD8+ or A530 (without invalidating the warranty). It has full access to the Amiga's resources and allows you to run PC and Amiga programs at the same time, giving you two computers in one.

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AMIGA SHOPPER (HD8+)

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'... the build quality is excellent ... in terms of performance, their gear is the best ... their equipment is worth every penny'.
AMIGA FORMAT 9/92 (A530)

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MODEL	80Mb	120Mb	213Mb
HARD DRIVE HD8+	£399 Ref: HAR 0888	£449 Ref: HAR 0922	£699 Ref: HAR 0933
A530 COMBO HARD DRIVE & ACCELERATOR	£699 Ref: HAR 0968	£749 Ref: HAR 0974	£999 Ref: HAR 0983

FOR ALL AMIGAS



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- *Plugs into parallel port*
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MUS 2500 **£49.95**

AMIGA 1500 + 2000 + 3000 PRODUCTS

ACCELERATORS

	030 25MHz	030 40MHz	030 50MHz	NEW! 040 33MHz
Processor	68030EC	68030EC	68030	68040
Speed MIPS	7.48	12.1	15	30
Speed MHz	25	40	50	33
Math co-proc	68882	68882	68882	Built-in
Standard 32-bit RAM	1Mb	4Mb	4Mb	4Mb
Maximum 32-bit RAM	13Mb	16Mb	16Mb	16Mb
Extras	SCSI	SCSI	SCSI	SCSI Ser/Par
Code	UPG 0110	UPG 0430	UPG 0533	UPG 0740
PRICE	£599	£849	£1199	£1699

All GVP G-Force accelerators can be turned into a hard card by adding a Mount Kit, GVA 4251, £39.95, making it the ULTIMATE Amiga 1500/2000 peripheral. Any 1" SCSI drive can then be mounted on to the accelerator.



HARD CARDS
- *Factory installed Hard Drives*
- *0, 80, 120, 213, & 420Mb options*
- *On-board 8Mb memory sockets*
- *Add up to 6 SCSI devices*

The Impact II HC8 hard cards are the equivalent of the HD8+ hard drive, but for the 1500 and 2000 models. They are some of the fastest hard drives available, and incorporate an unpopulated 8Mb RAM expansion.

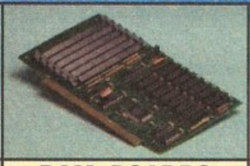
0Mb	Ref: HAR 1300	£129
80Mb	Ref: HAR 1388	£349
120Mb	Ref: HAR 1422	£399
213Mb	Ref: HAR 1533	£599
420Mb	Ref: HAR 1542	£999



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- *16 million colours @ 768 x 580 PAL Res*
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- *Now with RGB splitter*

Impact Vision 24 is the latest 24-bit Professional Video Adaptor. It features 16 million colours on screen at once, built-in genlock, flicker fixer, frame buffer, frame grabber and digital keyer. Supplied with Caligari-IV24 3D modelling and rendering software, Scala IV24 video titling software, plus Macro Paint 24-bit paint package. A1500/2000 requires additional adaptor, GVA 5224, £49.95

IV-24 - VIU SPLITTER	Ref: VID 7024	£1499
IV-24 - VIU TRANSCODER	Ref: VID 7124	£1899



RAM BOARDS
- *Up to 8Mb of FAST RAM*
- *Upgrade in 2Mb increments*
- *Supports industry standard RAM chips*
- *Diagnostic software included*
- *Fully auto-configuring*

The RAM-8 offers an easy way to upgrade your 1500 or 2000 in 2Mb increments up to 8Mb. The RAM 8 is fully auto-configuring and is supplied with peace-of-mind diagnostic software. 6Mb configuration supported for bridgeboard owners

0Mb populated	RAM 2800	£99
2Mb populated	RAM 2802	£149



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- *Syquest 44 or 88Mb removable media*
- *Available with or without HC8 Controller*
- *20ms access time*
- *GVP HC8 Controller option extra*
- *External case available for A500/3000*

Each drive comes with a removable cartridge.

External Case	Ref: GVA 5019	£179
44Mb (Bare Drive)	Ref: HAR 1554	£399
44Mb (+HC8)	Ref: HAR 1568	£479
88Mb (Bare Drive)	Ref: HAR 1678	£499
88Mb (+HC8)	Ref: HAR 1691	£579

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Before you decide when to buy your new Amiga products, we suggest you think very carefully about WHERE you buy them. Consider what it will be like a few months after you have made your purchase, when you may require additional peripherals and software, or help and advice. And, will the company you buy from contact you with details of new products? At Silica Systems, we ensure that you will have nothing to worry about. We have been established for almost 14 years and, with our unrivalled experience and expertise, we can now claim to meet our customers' requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now for our latest FREE literature and begin to experience the "Silica Systems Service".

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LONDON SHOP: Opening Hours: Mon-Fri 9.30am-7.00pm (Sat close 6.30pm)	Selfridges (1st Floor), Oxford Street, London, W1A 1AB	Late Night: Thursday - 8pm	**Tel: 071-629 1234** Extension: 3914
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PRODUCT LOCATOR

SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE

Welcome to the *Amiga Shopper* Buyer's Guide, your regular guide to what's hot and what's not in the Amiga market place. It's designed as a simple-to-use yet comprehensive guide which will help you to make the right buying decisions. It may not include each and every product ever produced for the Amiga (that would take up virtually the whole of *Amiga Shopper*!), but rest assured that all the major brands are here.

The Buyer's Guide will run each and every month and as new products are released and others discontinued, we'll be updating it accordingly. This month we bring you what is possibly the most comprehensive guide to software for the Amiga owner.

PAINT PROGRAMS

Product	Supplier	Price	Screen Modes	Max Colours	Overscan	Animation	Rating	Issue
MyPaint	HB Marketing	£20	L	12	No	No	***	2
The Graphics Studio	Accolade	£50	L/M	32	No	No	***	2
Deluxe Paint 3	Electronic Arts	£70	L/LI/M/H	64	Yes	Yes	*****	2
Deluxe Paint 4	Electronic Arts	£90	L/LI/M/H	4096	Yes	Yes	*****	10
Deluxe PhotoLab	Electronic Arts	£130	L/LI/M/H	4096	Yes	No	***	2
DigiPaint 3	Silica Systems	£80	L/LI	4096	Yes	No	****	2
Photon Paint 2	MicroIllusions	£90	L/LI	4096	Yes	Yes	*****	2
SpectraColour	HB Marketing	£60	L/LI	4096	Yes	Yes	***	5

L-Low Res, LI-Low Res Interlaced, M-Medium, H-High Res

ANIMATION SOFTWARE

Product	Supplier	Price	ANIM Compat	Onion Skin	X-Sheet	Sound	Rating	Issue
Disney Animation Studio	Silica	£80	Yes	Yes	Yes	Yes	****	1
Fantavision	HB Marketing	£50	No	No	No	Yes	****	14
MovieSetter	Silica	£80	No	No	No	Yes	****	14
Take-2	Rombo	£95	No	No	Yes	Yes	****	14

SOLID MODELLING/RAY TRACING

Product	Supplier	Price	Ray Tracing	24-bit	Animation	Bump Maps	Textures	Rating	Issue
Real 3D 1.4	Alternative Image	£120	Yes	Yes	Yes	Yes	Yes	*****	4,7
Imagine	Silica	£235	Yes	Yes	Yes	No	Yes	*****	4,7
3D professional	Marcam	£260	Yes	Yes	Yes	No	Yes	***	7
Draw 4D	Surface UK	£150	No	No	Yes	No	Yes	***	7
Sculpt 4D	Alternative Image	£400	Yes	Yes	Yes	No	Yes	*****	7
Imagine 2	Computech	£270	Yes	Yes	Yes	Yes	Yes	****	14
RayDance	Radiance	£100	Yes	Yes	No	Yes	Yes	***	14

MISC GRAPHICS

Product	Supplier	Price	Type	Rating	Issue
VistaPro	HB Marketing	£100	Fractal Landscapes	*****	7
Genesis	MicroIllusions	£50	Fractal Landscapes	****	11

IMAGE PROCESSORS

Product	Supplier	Price	24-bit	Max Colours	File Formats	Composition	Colour Control	Rating	Issue
ImageMaster	Amiga Ctr Scot.	£175	Yes	16.7m	IFF	Yes	Yes	*****	18
Art Department	Silica	£100	Yes	16.7 m	Many	No	Yes	****	-
Art Department Pro	Silica	£200	Yes	16.7 m	Many	Yes	Yes	*****	10
PIXmate	Precision	£70	No	4096	IFF, Neo	No	Yes	****	-
Butcher 2	HB Marketing	£50	No	4096	IFF	No	Yes	***	-

PAGE LAYOUT SYSTEMS

Product	Supplier	Price	Outline Fonts	Pantone	Postscript	24-bit Col	Colour Sep	Rating	Issue
PageStream 2.2	Silica	£200	Yes	No	Yes	Yes	Yes	***	2,3
ProPage 2.1	Silica	£250	Yes	Yes	Yes	Yes	Yes	*****	1,17
Saxon Publisher	Surface UK	£250	Yes	No	Yes	Yes	Yes	***	17
PageSetter 2	Silica	£100	Yes	No	No	No	No	***	-
Shakespeare	Cloudhall	£100	No	No	Yes	No	Yes	***	-
CityDesk	Precision	£130	No	No	Yes	No	No	**	-
ProPage 3.0	Silica	£250	Yes	Yes	Yes	Yes	Yes	*****	17

STRUCTURED DRAWING PROGRAMS

Product	Supplier	Price	Bezier Curves	Postscript	Outline Fonts	EPS compat	Rating	Issue
ProDraw 2.1	Silica	£132	Yes	Yes	Yes	Yes	*****	-
DesignWorks	Silica	£100	Yes	Yes	Yes	No	**	-
ProDraw 3.0	Silica	£132	Yes	Yes	Yes	Yes	****	-
Expert Draw	HB Marketing	£70	Yes	Yes	Yes	Yes	***	14

CAD PACKAGES

Product	Supplier	Price	DXF Compat	No. Of layers	Vector Fonts	PostScript	Rating	Issue
DynaCADD	ExpressWorks	£650	Yes	256	Yes	Yes	****	3
X-CAD 2000	Digital Multimedia	£129	Yes	255	Yes	With util included	****	-
X-CAD 3000	Digital MultiMedia	£300	Yes	255	Yes	With util included	*****	-

PRODUCT LOCATOR

UltraDesign	Marcam	£200	Yes	128	Yes	Yes	***	-

WORD PROCESSORS

Product	Supplier	Price	Spell Checker	Thesaurus	Picture Import	Rating	Issue
Mini Office 2	Europress	£69	Yes	NO	NO	****	17
Scribble!	HB Marketing	£30	Yes	No	No	***	6,9
Transwrite	HB Marketing	£40	Yes	No	No	***	6,9
Pen Pal	Harwoods	£80	Yes	No	Yes	****	6,9
Kind Words 2	HB Marketing	£50	Yes	No	Yes	**	6,9
Protext 5.5	Arnor	£150	Yes	Yes	No	*****	6,9
Wordworth	Digita	£130	Yes	Yes	Yes	****	4,6,9
Excellence 3	HB Marketing	£79.95	Yes	Yes	Yes	****	-
ProWrite 3.2	Silica	£143	Yes	Yes	Yes	***	12
Word Perfect	Sentinel	£230	Yes	Yes	No	***	-
Final Copy	Gordon Harwood	£TBA	Yes	Yes	Yes	****	15

DATABASES

Product	Supplier	Price	Type	Programmable	dBASE Compatible?	Rating	Issue
Mini Office 2	Europress	£69	Card Index	No	NO	***	17
Infofile	HB Marketing	£50	Card Index	No	No	***	9
ProData 1.2	Arnor	£100	Card Index	No	Yes	****	9
SuperBase	Precision	£30	Relational	No	Yes	****	9
SuperBase 2	Precision	£100	Relational	No	Yes	****	9,12
SuperBase Pro 4	Precision	£400	Relational	Yes	Yes	*****	4,9
Organize 2	HB Marketing	£62	Relational	No	Yes	***	-

SPREADSHEETS

Product	Supplier	Price	Lotus Compatibility	Graphs	Rating	Issue
Mini Office 2	Europress	£69	No	Yes	***	17
MaxiPlan 4	HB Marketing	£130	Yes	Yes	***	18
LP Calc	HB Marketing	£50	No	NO	*	19
SuperPlan	Precision	£80	Yes	Yes	***	9
Analyze!	Precision	£50	Yes	Yes	***	9
Maxiplan 500	HB Marketing	£80	Yes	Yes	***	9
ProCalc	Silica	£150	Yes	Yes	*****	-
Advantage	Silica	£100	Yes	Yes	****	1,9
K-Spread 3	Kuma	£70	Yes	Yes	***	9
K-Spread 4	Kuma	£100	Yes	Yes	****	9
DGCalc	Digita	£40	No	No	**	-
Analyze 2	HB Marketing	£50	Yes	Yes	***	-

MULTIMEDIA

Product	Supplier	Price	Interactive	External Drivers	ARexx	Rating	Issue
Presentation Master	HB Marketing	£350	Yes	No	No	****	9
HyperBook	Silica	£100	Yes	No	Yes	****	6
AmigaVision	Commodore	£80	Yes	Yes	Yes	****	-
CanDo 1.5	Checkmate Digital	£130	Yes	No	Yes	*****	-
Viva!	MicroDeal	£200	Yes	Yes	No	**	-

VIDEO TITLERS

Product	Supplier	Price	Overscan	Transitions	Amiga Fonts	Horiz Crawl	Rating	Issue
Broadcast Titler 2	HB Marketing	£234	Yes	Yes	No	Yes	****	2
Scala 1.1	Silica	£250	Yes	Yes	Yes	No	*****	2
Scala 500	Silica	£100	Yes	Yes	Yes	No	****	-
Alternative Scroller	Alternative Image	£50	Yes	No	No	Yes	***	-
Home Titler	HB Marketing	£40	Yes	No	No	Yes	***	9
ProTitler	HB Marketing	£100	Yes	Yes	Yes	Yes	***	9
Video Caption Designer	Maze	£200	Yes	No	Yes	Yes	***	3
Video Ease	Interactive Tchnlgy	£40	Yes	Yes	Yes	Yes	**	11

DTV UTILITIES

Product	Supplier	Price	Type	Rating	Issue
AntiA	Zen	£40	Font Enhancer	****	8
BT2 Font Enhancer	HB Marketing	£130	Font Enhancer	***	8
ShowMaker	Silica	£250	Presentation System	***	10
Elan Performer 2	Silica	£180	Presentation System	****	11
Deluxe Video 3	Electronic Arts	£100	Presentation System	****	-

MIDI SEQUENCERS

Product	Supplier	Price	No. of Tracks	Amiga Smpls	Song Arrange	Rating	Issue
Sequencer One	Gajits	£90	20	Yes	Yes	****	2

PRODUCT LOCATOR

Bars&Pipes Pro	Zone	£200	Unlimited	Yes	Yes	*****	3
Pro-24	Evenlode	£300	24	No	Yes	***	4
Harmoni	HB Marketing	£50	24	Yes	No	***	7
KCS 3.5	Zone	£280	48	Yes	Yes	*****	8
Tiger Cub	Zone	£100	12	Yes	Yes	****	-
Music-X	MicroIllusions	£150	256	Yes	No	****	-
Music-X Junior	MicroIllusions	£50	256	Yes	No	****	-
Master Tracks	MCM	£200	64	No	Yes	***	-
Trax	MCM	£70	64	No	Yes	*****	-
Sequencer One Plus	Gadgits	£50	32	Yes	Yes	****	16

MISC MIDI SOFTWARE

Product	Supplier	Price	Type	Rating	Issue
X-Or	Zone	£220	Librarian	****	6
CMPanion	Gajits	£100	Patch Editor	****	6
Caged Artist	Zone	£100	Patch Editor	***	6
Copyist Apprentice	Zone	£100	Score Notation	****	-
Copyist DTP	Zone	£230	Pro Score Notation	****	-
Audition 4	HB Marketing	£50	Sample Editor	*****	10
AudioMaster 4	HB Marketing	£80	Sample Editor	*****	-
Audio Sculpture	SMG	£50	Sample Sequencer	**	12
Quartet	MicroDeal	£50	Sample Sequencer	***	-
Mugician	Thalamus	£30	Sample Sequencer	***	-
Music Studio	HB Marketing	£25	Sample Sequencer	**	-
TFMX	HB Marketing	£45	Sample Sequencer	***	-
OctaMED 2	AmigaNuts	£20	Sample Sequencer	*****	-
SuperJAM!	Blue Ribbon Sound.	£100	Algorithmic Composition	****	15

EDUCATIONAL SOFTWARE

Product	Supplier	Price	Type	Rating	Issue
MicroFrench	LCL	£24	Language Tutor	****	17
Learn to Read With Prof	Prisma	£25	Reading	***	2
The Three Bears	School Software	£23	Reading	***	2
Donald's Alphabet Case	Entertainments Int.	£25	Reading	***	2
Let's Spell	Softstuff	£20	Writing	****	2
Things To Do With Words	Softstuff	£20	Writing	***	2
Kids Type	GeniSoft	£25	Writing	****	2
Mickey's Zoo	Entertainments Int.	£25	Maths	***	2
Game, Set & Match	GeniSoft	£21	Maths	**	2
Magic Maths	School Software	£23	Maths	***	2
Fun School 3	Europress	£25	3 'R's	*****	2
Fun School 4	Europress	£25	3 'R's	*****	9
Puzzle Book 1	Softstuff	£20	3 'R's	****	2
Sesame Street	Merit Software	£16	Painting	***	2
Play It Safe	Deja Vu	£3.50	General	****	2
Pick A Puzzle	Deja Vu	£2.50	Jigsaw	***	2
Hooray For Henrietta	Sketlander	£25	Maths	***	2
Back To Basics	HB Marketing	£40	Maths	***	9
Maths Adventure	HB Marketing	£26	Maths	****	9
Spell!	Europress	£9	Writing	***	3
Maths Blaster Plus	Ablac Computec	£40	Maths	***	3
Maths Mania	School Software	£23	Maths	****	3
Better Spelling	School Software	£23	Writing	****	3
Answer Back Quiz	Kosmos	£20	3 'R's	****	3
Weather Watcher	GeniSoft	£25	Weather	***	4
What Is It?	GeniSoft	£20	Geography	****	4
Better Maths	School Software	£23	Maths	***	4
French Mistress	Kosmos	£20	French	****	4
Mr Robot's Speak&Spell	HB Marketing	£25	Writing	***	6
Early Learning Maths	ESP Software	£20	Maths	***	6
SpelliCopter	ESP Software	£20	Writing	****	6
Spell Book	SoftStuff	£8	Writing	****	6
Cave Maze	Coombe Valley	£12	Quiz	***	7

PRODUCT LOCATOR

Maths Dragons	**Coombe Valley**	**£12**	**Maths**	***	**7**
Shapes & Colours	Rainbow	£8	Basic	****	7
First Letters	**Rainbow**	**£8**	**Reading**	***	**7**
Reasoning With Trolls	Coombe Valley	£15	Quiz	****	8
Spellbound	**Lander Software**	**£26**	**Writing**	****	**10**
Cound & Add	Lander Software	£26	Maths	****	10
Pepe's Garden	**Prisma**	**£26**	**3 'R's**	****	**10**
Picture Book	Triple 'R' Education	£20	3 'R's	*****	10
Money Matters	**Triple 'R' Educational**	**£20**	**Money**	*****	-
Maths Adventure	Kosmos	£26	Maths	***	12
Compendium Six	**HB Marketing**	**£35**	**Six educational programs**	*****	**14**

PROGRAMMING LANGUAGES

Product	Supplier	Price	Language	Compiler	Rating	Issue
Aegis Visionary	Precision	£59	Adventure	Yes	***	17
HiSpeed Pascal	**HiSoft**	**£100**	**Pascal**	**Yes**	****	**19**
GFA BASIC 3.5	GFA Data Media	£50	BASIC	Separate	****	3,9
GFA Compiler	**GFA Data Media**	**£30**	**Compiler**	**-**	****	**3,9**
Blitz	Siren Software	£70	BASIC	Yes	***	3,9
AMOS	**Europress**	**£50**	**BASIC**	**Separate**	*****	**3,9**
AMOS Compiler	Europress	£30	Compiler	Yes	****	5,9
AMOS 3D	**Europress**	**£30**	**BASIC Extension**	**-**	*****	**5,7**
AMOS Tome	Deja Vu	£30	BASIC Extension	-	****	11
Easy AMOS	**Europress**	**£35**	**BASIC**	**No**	*****	**12**
HiSoft BASIC	HiSoft	£50	BASIC	Yes	****	9
RQ Forth	**HB Marketing**	**£80**	**Forth**	**Yes**	****	**9**
Lattice C 5	HiSoft	£230	C	Yes	*****	3,9
Aztec C	**Precision**	**£130**	**C**	**Yes**	****	**9**
M2 Amiga	Real Time	£125	Modula-2	Yes	****	7,9
ArgAsm	**HB Marketing**	**£60**	**Assembly**	**-**	***	**9**
Devpac 3	HiSoft	£70	Assembly	-	*****	10,12

UTILITIES

Product	Supplier	Price	Type	Rating	Issue
Reverser	Alternative Image	£10	Animation Utility	****	17
Director 2	**Alternative Image**	**£100**	**Video Presentation scripting language**	***	**19**
Ami-Back 1.4	Omega Projects	£50	Hard Disk Backup	*****	9
QuarterBack	**HB Marketing**	**£50**	**Hard Disk Backup**	****	**5**
Personal Fonts Maker	HB Marketing	£70	Bitmap Font Editor	***	7
GB Route Plus	**Complex Computers**	**£80**	**Journey Planner**	*****	**10**
GB Route Plus Edit	Complex Computers	£30	Editor For GBRoute	****	10
Flow 3.0	**Silica**	**£80**	**Ideas Processor**	***	**10**
Turbo Print Pro	HB Marketing	£50	Enhanced Printing	****	11,12
Directory Opus	**Checkmate Digital**	**£40**	**Directory Utility**	*****	**-**
MapMaster	Alternative Image	£54	Image Mapping package	****	14
SurfaceMaster	**Alternative Image**	**£28**	**Add on for Imagine**	****	**14**
Touch Typist	Sector Software	£14	Teach yourself touch typing	****	15
SaxonScript	**Surface UK**	**£100**	**Postscript interpreter**	***	**15**
Smooth Talker	Zen Computers	£140	Video Prompting package	****	16
HotLinks	**Silica**	**£70**	**Add on for PageStream 2.2**	**	**16**
Shades	Meridian Software	£60	Gradient fills for PageStream	**	16
Hit Kit!	**Gadgits**	**£25**	**Sequences for Sequencer One**	***	**16**

SUPPLIER LIST • SUPPLIER LIST • SUPPLIER LIST • SUPPLIER LIST • SUPPLIER

Ablac Computec	0626 331464
Accolade	071 738 1391
Alternative Image	0533 440041
Amiga Centre Scotland	031 557 4242
Arnor	0733 68909
Checkmate Digital	071 923 0658
Cloudhall	0604 231211
Commodore	0628 770088
Complex Computers	0706 224531
Computech	0702 206165
Coombe Valley	0626 779695
Deja Vu	0942 495261
Digita	0395 270273
Digital Multimedia	0702 206165
Electronic Arts	0753 549442
Entertainments Int	0268 541212
ESP Software	0702 600557
Europress	051 357 1275
EvenLode	0993 898484
SoundWorks	
ExpressWorks	0252 726255
Gagits Music Software	061 236 2515
GeniSoft	0753 686000
GFA Data Media	0734 794941
Harwoods	0773 836781
HB Marketing	0753 686000
HiSoft	0525 718181
Interactive Technology	0423 501321
Kosmos	0525 53942
Kuma	0734 844335
Lander Software	041 357 1659
Marcam Ltd	071 258 3454
MCM	081 963 0663
Meridian	0533 896743
Merit Software	0101 214 385 2353
MicroIllusions	0480 496497
Omega Projects	0925 763946
Precision	081 330 7166
Prisma Software	0244 326244
Radiance	0101 408 270 7420
Rainbow	0392 77369
Real Time Associates	081 656 7333
Rombo Productions	0506 466601
School Software	010 353 61 45399
Sentinel	0932 231164
Silica	081 309 1111
Siren Software	061 724 7572
Sketlander	041 357 1659
SMG	0274 562999
Softstuff	0732 351234
Surface UK	081 566 6677
Triple 'R' Software	0742 780370
Zone	081 7666564

WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN

FREE! over £1,900 of Wordworth

Digita International has given us ten copies of its new word processor Wordworth 2, *plus five copies of* Wordworth 1.1 *for runners up*

Acclaimed as one of the top Amiga word processors, *Wordworth* is an excellent tool for wordsmiths, poets and anyone who needs to write.

As you read this, Digita is set to launch version 2, which, as well as a much-improved user interface, promises many brand new features.

When Jeff Walker reviewed version 1 for *Amiga Shopper*, his verdict was clear: "Pounds-per-feature, no other Amiga word processor comes close.
"I predict that *Wordworth* will become *the* word processor for the Amiga." You'll have to wait until next month to read what he has to say about the latest version, but it's a safe bet that it will be complimentary.

The package's impressive list of new features includes the ability to output documents at the highest resolution of any printer used. A total of 17 scalable Agfa fonts are included, all of which can be magnified to beyond 800 points in size. All this in addition to the previous version's already impressive array of features.

Wordworth 2 will sell for £129.99, but thanks to Digita we have 10 free copies to give away. In addition, we have five copies of the earlier *Wordworth 1.1* for runners-up.

As usual, entering the competition couldn't be easier. Just have a go at the three questions in the panel, jot your answers along with your name and address on the back of a postcard or envelope, and send it to:

Poetry In Motion
Amiga Shopper
29 Monmouth Street
Bath BA1 2DL
(Closing date: December 4. Only one entry per household)

THE CHALLENGE

QUESTION 1

From which play does the phrase *though this be madness, yet there is method in't* come?

a) Hamlet
b) Macbeth
c) Man And Superman

QUESTION 2

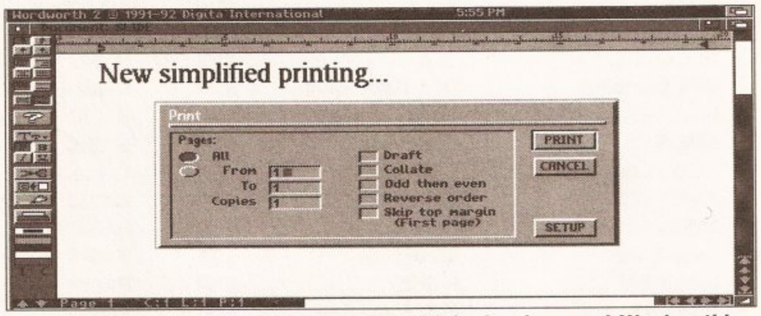
***A host, of golden daffodils* comes from which Wordsworth poem?**

a) The Wanderer
b) The Excursion
c) I Wandered Lonely As A Cloud

QUESTION 3

Who wrote *The Wasteland*?

a) Wilfred Owen
b) TS Eliot
c) James Joyce



In conjunction with university researchers, Digita has improved *Wordworth's* user interface in many ways, including the print requester

SPECIAL ANNOUNCEMENT!

IN NEXT MONTH'S ISSUE...

● A cover disk! It's the arrival of the *Amiga Shopper Shareware Collection Volume One*, packed full of the best and latest in PD and shareware utilities. For the special price of £2.25 we'll give you the best in serious software.

● *The Amiga Shopper* Awards – a mammoth analysis of the best products that have been launched for the Amiga this year. Each of our major contributors will have his say on which products performed the best in his field – business, desktop publishing, graphics, video, hardware, the lot.

Plus regular columns on Amiga Answers, public domain, video, AmigaDOS, desktop publishing, programming, education, business and much more

>>>> On sale Thursday, December 3 >>>>

ColourPic
NEW !



ColourPic is JCL's best selling video digitiser. Grabbing frames from a live video source in 64,000 vibrant colours is simplicity itself. If you have struggled with a colour wheel or splitter and have had to limit your video digitising to static objects or just monochrome, you will find ColourPic pure joy. ColourPic has its own built-in 64,000 colour framestore which is constantly digitising the incoming picture in REAL-TIME. Just press a key to freeze the picture and import it into the Amiga. It couldn't be easier!

NEW! ColourPic has been upgraded to include a S-VHS (Y-C) input and is now shipped with 'Cabaret' our comprehensive 24-bit image processing software in addition to the standard ColourPic software.

- **ColourPic can capture lo-res, interlace or hi-res images and convert them to HAM, 32 colour, 16 colour and monochrome IFF files.**
- **ColourPic has RGB, composite and UHF TV outputs from its framestore to drive a second monitor.**
- **ColourPic works with all Amiga computers, even the A500P.**
- **ColourPic can be upgraded to ColourPic AniMate.**
- **ColourPic has comprehensive monochrome image processing tools.**
- **ColourPic is shipped with Cabaret 24-bit image processing software.**

ColourPic	**RRP £499 inc VAT**
ColourPic AniMate	**RRP £599 inc VAT**



SuperPic



SuperPic is a framegrabber and genlock in one box! It is the perfect answer to anyone who needs all the facilities of real-time colour video digitising and the ability to combine computer generated graphics with a video source. SuperPic has a built-in 64,000 colour framestore which is constantly digitising the incoming video source in real-time. Just press a key to freeze the picture and import it into the Amiga. It just couldn't be easier! The genlock built in to SuperPic has an RGB output for the finest possible results in addition to composite output and provides the Amiga user with a very stable product, ideal for titling.

NEW! SuperPic is now shipped with 'Cabaret' our comprehensive 24-bit image processing software in addition to the standard SuperPic software and a three button optical mouse with mat.

- **SuperPic can capture lo-res, interlace or hi-res images and convert them to HAM, 32 colour, 16 colour and monochrome IFF files.**
- **SuperPic can be upgraded to SuperPic AniMate.**
- **SuperPic has it's own built-in genlock for combining computer generated graphics with a video picture – ideal for titling.**
- **SuperPic allows you to switch between Amiga display, framestore and video outputs on your standard RGB monitor at the touch of a button.**
- **SuperPic is shipped with Cabaret 24-bit image processing software.**

SuperPic	**RRP £599 inc VAT**
SuperPic Animate	**RRP £699 inc VAT**

ColourPic Plus
NEW !



ColourPic Plus, JCL's latest addition to their Amiga real-time colour video digitiser range, brings you the most powerful digitiser available to the Amiga user in its price range. A professional machine engineered to the highest standards and using the latest technology, ColourPic Plus combines all the features present in ColourPic with AniMate as standard and an impressive number of new features and new software.

The Impossible? – ColourPic Plus can do it!

Combine a framestore picture in 64,000 colours with text on an Amiga database display – without a genlock! With the optional 'Grabit' software from JCL and a prepared database control language module you can add pictures to your personnel file or parts list. Your database pictures could even be animated!

- **ColourPic Plus can capture lo-res, interlace, hi-res or hi-res with interlace images and convert them to HAM, 32 colour, 16 colour and monochrome IFF files.**
- **ColourPic Plus is shipped with 512K RAM and can be upgraded to 1MB for more animation frames and even higher resolution modes.**
- **ColourPic Plus can switch between your Amiga display and the 64,000 colour framestore picture at the press of a key.**
- **ColourPic Plus has S-VHS (Y-C), RGB and composite inputs and provides RGB, composite and UHF TV outputs for an extra monitor if required.**
- **ColourPic Plus is shipped with Cabaret Plus 24-bit image processing software.**

ColourPic Plus	**RRP £699 inc VAT**

AniMate

AniMate, for ColourPic and SuperPic, adds a whole new dimension to video digitising – colour animation. The complete AniMate package upgrades the digitiser to 512K RAM using a special RAM expansion card with time marker control logic and includes control software and manual. AniMate provides a simple and complete method of producing short sequence colour animated images on an Amiga, where the images come from live video such as a camera or a VCR. Simply point a camera at a moving object, select ANIM RECORD/SEQUENCE and press the space bar to capture a series of real life movements.

- **ANIM SET options include frame delay and first field hold off.**
- **ANIM RECORD options include sequence record and single step record.**
- **Select ANIM PLAY/CYCLE and the recorded sequence is repeated.**
- **ANIM PLAY options include sequence, single step, mouse scroll, cycle and ping-pong.**
- **Sequences recorded from a VCR may be joined together to produce ANIM files.**
- **The interval between recorded fields can be set at any number of fields.**
- **The individual fields of an animation may be examined by using the up/down movement of a joystick.**
- **Fields from an animation sequence may be converted to standard Amiga IFF format and then built into an ANIM format file for replay.**

Upgrade your ColourPic or SuperPic for £150 inc VAT

Cabaret

CABARET the image processing package shipped with ColourPic and SuperPic provides image import facilities together with colour and monochrome image processing functions to modify existing pictures. Cabaret has a wide range of filter and masking options to enhance pictures and produce interesting effects.

- **Cabaret will import and display HAM, EHB, 32, 16, 8 and 4 colour pictures plus Monochrome and Threshold images in normal and overscan modes.**
- **Cabaret will SAVE and LOAD images in standard IFF format, plus a wide range of other formats including TARGA and AIM.**
- **Cabaret will produce X & Y flips, mirror images, multiple images, magnified parts of an image and control colour balance, contrast and brightness.**
- **Cabaret works on all Amigas with 1 MByte or more of memory.**

CABARET PLUS software, which needs 3 MByte of memory to make full use of all facilities, has all the features of Cabaret – **PLUS**

- **Extra filters including Uniform, Kuwahara, Posterize, Median and Gamma.**
- **New features including Emboss, Dropshadow and Combine.**
- **Interlace and hi-res modes AND Save in 24-bit IFF!**

For the user with less than 3 MByte of memory the Cabaret functions may be used without the 'Plus' features.

Cabaret RRP £29.95 inc VAT Cabaret Plus RRP £89.95 inc VAT

ColourPic, SuperPic and ColourPic Plus are available from selected dealers or direct from JCL.

** GOLD DEALERS AND STOCKISTS!! **

Trilogic
253 New Works Road
Low Moor
Bradford
BD12 0QP
Tel: 0274 691115

Computer Care South Ltd
499 Oxford Road
Reading
Berks
RG3 1HQ
Tel: 0734 393615

Gordon Harwood Computers
New Street
Alfreton
Derbyshire
DE5 7BP
Tel: 0773 836781

Ultima
First Floor
White Lion Walk
Guildford
Surrey, GU1 3DW
Tel: 0483 506939

Videoquip
5 Fosse Road South
Leicester
LE3 0LP
Tel: 0533 558818

Silica Systems
1-4 The Mews
Hatherley Road
Sidcup
Kent, DA14 4DX
Tel: 081 302 8811

JCL

About our framestore. . .

All of JCL's video digitisers can grab a frame from a live video source in 1/25th of a second using a 64,000 colour framestore which is constantly digitising the incoming picture in real-time. The framestore displays a picture of such high quality that you may suspect you are looking at a straight through connection from the video input, but don't be deceived, this is a digital picture, just press the Z key to see it freeze! The framestore's 64,000 colour palette can be used to display previously digitised images stored on a disk as well as show Sculpt (and other) images in a much wider range of colours than the Amiga's HAM mode. The effect is stunning!

For your free show disk of pictures:-
Contact Carolyn on 0892 518181.

Access VISA EUROCARD



JCL BUSINESS SYSTEMS LTD.
71 St Johns Road Tunbridge Wells Kent TN4 9TT England
Tel 0892 518181 Int +44 892 518181 Fax: 0892 511772 Int +44 892 511772

WE PUT YOUR PIECES TOGETHER

Puzzled about music and the Amiga? Look to us for the answers!

At The Blue Ribbon SoundWorks, we've developed a strong lineup of talent. Each of our products receives the special care it takes to produce a winner. That's why you'll find a Blue Ribbon on every box!

Take **SuperJAM!** With this **automatic copyright-free composer**, you'll be writing the next hit song or creating the **perfect soundtrack for your video production** in no time. SuperJAM! comes with over 30 different musical styles and a backup band that performs beautifully, whether it's Mozart or Motown. And with the **Extras Disks** for SuperJAM!, you can **instantly increase your repertoire** with styles like Fusionist, FunkJungle, Rachmaninoff and Rockapeggio.

Our **One-Stop Music Shop turns your Amiga into a powerful music machine!** This hardware-software combination includes all you need to get 16-bit stereo multi-timbral audio for an incredible price!

When you're ready for **multi-track recording, automated mixing, notation printing and state-of-the-art MIDI sequencing,** you're ready for **BARS&PIPES PROFESSIONAL**. Special effects, multi-media sync, sophisticated harmonies, non-destructive editing, and an unlimited number of tracks for recording only begin to describe it. Plus, you can integrate it seamlessly with SuperJAM!

If you're into MIDI but don't need full power, check out **BARS&PIPES**, **music software made simple**. BARS&PIPES features multi-track recording, graphical editing, tempo mapping and more. BARS&PIPES is expandable, so it grows as you do.

Once the music is flowing, pick and choose from the **BARS&PIPES ADD-ON SERIES**. These packages make BARS&PIPES or BARS&PIPES PROFESSIONAL **even more fun to own.**

Use the **Creativity Kit** to **invent fresh musical ideas,** or the **Pro Studio Kit** for complete control of your MIDI studio. The **Internal Sounds Kit** eliminates the need for MIDI altogether. Imagine, multi-track recording inside your computer! To round it off, we present **Rules for Tools**, documentation and C source code for writing your own musical features.

To get organized, grab **The PatchMeister**, our graphical, **universally-configurable MIDI patch librarian.** It comes with dozens of MIDI drivers and templates. Don't see what you want? Make it yourself with the special driver creation feature. And, The PatchMeister integrates easily into BARS&PIPES PROFESSIONAL for the ultimate composition environment.

Want to triple the capacity of your MIDI studio? Use **Triple Play Plus**, our MIDI interface that includes **3 separately-addressable MIDI outs for 48 simultaneous MIDI channels.** Of course, we designed it especially for our software. No compatibility problems here.

Synchronizing with video and audio tape is simple with **SyncPro**, our **universal SMPTE synchronization box** for audio, video and multi-media production. Yes, it comes with special Blue Ribbon software and works with any Amiga application that supports MIDI Time Code.

The Blue Ribbon SoundWorks. When it comes to quality, we don't miss a beat!

THE BLUE RIBBON SOUNDWORKS LTD

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Atlanta, Georgia 30306 USA
(404) 377-1514
fax (404) 377-2277